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Executive summary

Introduction

TESS aims to assist the integration of information about biodiversity and related environmental matters from the local level into planning and land-use decisions. At the same time it aims to encourage local people to collect such information in order to maintain and restore biodiversity ecosystem services. To achieve these aims, a decision support system will be designed to exchange information required in environmental assessments at all levels for information that benefits local recreation and livelihoods. The purpose of the first two scientific Work Packages (WP's) was to assess the demand for information by describing flows qualitatively, through enquiry into formal top-down requirements in WP2 and for informal needs at local level in WP3.

Work Package 2: central environmental information

WP2 had as its main objective to identify information needs of government for SEA, SIA and other aspects of biodiversity conservation and sustainable development and how that information was obtained. After preliminary analysis it was decided to focus on (Environmental Impact Assessment) EIA and Strategic Environmental Assessment (SEA) but also to include information needs related to biodiversity as it interacts both with land use planning LUP), with the operation of the EU Common Agricultural Policy (CAP) and agricultural policy generally, and with Biodiversity Action Plans (BAPs) under Article 6 of the Convention on Biological Diversity (CBD).

Ensuring that the environmental impact of major actions which lie in the future is assessed before they are given the go-ahead is a fundamental aspect of EU policy. In the case of projects this is given effect by the EIA Directive of 1985 as amended. It requires that relevant environmental information is to be presented by the developer, that official bodies concerned with the environment are consulted, that where impacts are negative mitigation measures are considered, that the public are able to contribute to the process and that implemented projects are to be monitored. Although some major projects must always receive EIA, member states are given considerable flexibility in setting the thresholds for EIA to apply to a wide range of other categories, including the conversion of semi-natural or uncultivated land into intensive agriculture, which could be important for biodiversity.

The Commission is required to review the implementation of the EIA Directive by member states every five years and the findings of the most recent reviews (2003 and 2009) are summarised. After initial teething problems the Directive is considered by the Commission to be working satisfactorily across the EU-27.

The SEA Directive (2001) applies the same policy to plans and programmes of an official character, i.e. in the public rather than the private sector. There are some minor variations in the requirements, notably relating to the presentation of alternatives. The plans and programmes can relate to a wide variety of sectors though most SEA's are carried out in the case land use planning frameworks. The first Commission-led review of the SEA Directive (2009) concludes that the Directive is still bedding down but is making a positive contribution to environmental policy. A lack of guidance on predicting impacts and variations in the availability of relevant information at an appropriate scale are noted. Information about the number of SEA's being carried out in each member state is patchy, but it is clear that wide and mostly unexplained variations exist.

Monitoring of plans and programmes which have been subject to SEA appears to be weak or non-existent.

These EU instruments are studied in more detail in the case of their implementation via government regulations in the UK. In particular official guidance to responsible authorities and to the interested public, as well as guidance from experts and NGO's, is described and found to contain a wealth of information about environmental and biodiversity data sources, including websites. The requirements for biodiversity information to be available for the land use planning system, the information resources to be derived from Biodiversity Action Plans (BAP's) at various levels and the input of information into Common Agricultural Policy (CAP) environmental regimes are also described. This analysis was then used to devise an enquiry into information used for central purposes across a further eight countries where there were TESS partners.

National level enquiry

A national level enquiry template was devised in consultation with partners, returns being received and analysed between June and October 2009. It was found that EIA, SEA and CAP legislation was generally transposed into domestic law at national level where land-use planning law was also made, but that approvals for projects, plans and support were generally at subordinate levels where EIA and LUP were concerned. Some countries have applied EIA and SEA more widely than required by the Directives. Monitoring of approved projects was either mandatory or encouraged and was the responsibility of the developer reporting either to specialist national authorities or to those giving the original approval. Information (or lack of it) about numbers of EIA's and SEA's carried out annually corresponded with the findings of the Commission reviews. Thresholds for the application of the EIA provisions on conversion of land for agricultural intensification varied considerably, but appeared in any case to be little used. In all countries NGO's were involved with some EIA cases, but this was mainly national NGO's: regional and local levels were much less represented. In all countries the LUP system took account of biodiversity conservation and in some cases ecological connectivity. Official and informal guidance on EIA and SEA was widespread and most examples pointed to relevant data sources, including those for biodiversity. Websites containing such data were generally available, with protected species and area lists being universal but baseline and trend data on species populations and habitat area much less common.

All but one country had implemented national BAP's, but only the UK had significant numbers of sub-national and local plans including locally generated monitoring data. When looking at CAP requirements for biodiversity information the enquiry found that only a minority of countries had moved entirely to area-based payments subject to cross-compliance and that only one of these required environmental data in advance of making payments, though all required subsequent checks. Most operated agri-environment schemes involving higher level payments but in half of cases these were confined to Natura 2000 or other protected areas.

Provisional conclusions from Work Package 2

Provisional conclusions from these studies include concerns about the wide variation in the numbers of EIA's by country which are not explained by their relative size, the lack of any measures to ensure consistent quality in the environmental information used in assessments and the failure to make the information assembled available for ongoing environmental monitoring. While biodiversity data for decision making is freely available on the internet, and therefore accessible, the coverage and quality are variable,

especially in relation to the local level. There is a lack of high level policy responsibility for ensuring the adequacy of such data for achieving environmental objectives, although the INSPIRE Directive (2007 EC) is a major effort towards achieving this at European Union level.

Work Package 3: local environmental information

TESS Work Package 3 (WP3) was designed to gather information at the local level, in rural areas, to complement the information collected concerning the national level in TESS WP2. This local enquiry gathered data from 9 case study areas, in 8 countries, to characterise the use of information on biodiversity and ecosystem services in the environmental decision making process. Conducting the survey across the TESS partner countries allowed the consortium to research local requirements across a range of governance systems and bioregions in EU and accession states.

At the local level, the decisions include formal processes like SEA and EIA, as in WP2, but also local planning applications, and the myriad informal decisions made by communities and individuals that are small-scale individually, but summate to change the environment.

The enquiry at local level therefore considered (i) local administrations involved in formal assessment and planning decisions, including participatory processes, and informal decisions for managing public land or guiding community actions; and (ii) informal decisions by local stakeholders.

The enquiry addresses the following questions relating to the flow of information on biodiversity and ecosystem services at the local level:

- What are the information needs?
- What determines the information needs?
- What information is used?
- What information is needed but currently unobtainable?
- What are the barriers to obtaining information?

Analysis of the survey data addresses these questions across the sample of countries. It also provides preliminary insights into the potential for analysis of the relationships between the utilization of such information, and key differences between the case study areas. Such differences might include their environmental governance, the nature and extent of community participation, land-use, and status in terms of biodiversity conservation. These insights, and accompanying critique of the survey methods, will be used to plan and develop the following work packages of this project.

Local level enquiry

Researchers in each of the partner countries completed desk studies and a series of structured interviews to characterise the TESS case study areas and to evaluate the supply and demand of environmental information and its use in decision-making for activities that affect biodiversity and related environmental concerns. The case study areas were all situated in rural areas but were selected to represent a range of governance systems and landscape types.

For each case study area, the TESS partners identified the two lowest tiers of government and at least six local stakeholders from distinct sectors (e.g. forestry and farming) who would all be involved, in some way, in environmental decision-making. At

the same time as seeking to represent a range of conditions, efforts were made to find tiers of government and stakeholder representatives that were as equivalent as possible between countries. Each TESS partner country produced a 'synopsis' document giving textual detail on relevant aspects of the systems of local governance for environmental decision-making, the availability of suitable data to inform these decisions and information on communications and community engagement. These summaries also provided details of the environmental and social characteristics of each case study area.

Each TESS partner also conducted a series of structured interviews with selected government and community representatives within their case study. Interviewees were selected from the two tiers of local government. Partners were guided to seek both officials and elected representatives where relevant in order to obtain responses with a good potential for reflecting the circumstances in that area. In order to survey the functions of stakeholders in the community in environmental decision-making, a sample of individuals were found and interviewed within each case study area.

Provisional conclusions from Work Package 3

An important caveat to interpretation of the result from WP3 is that they represent a pilot stage in the TESS project leading to a much more extensive survey in TESS WP5. They are therefore based on a small sample of case studies and it is the range of responses that is generally of more interest than other statistics (such as averages) that would require a much larger sample.

The survey found that all groups of interviewees spent a substantial proportion of time considering environmental matters when making management decisions although the greatest needs for environmental information were in government, nature-watching/reserve management and forestry. The demand for environmental information varied between the groups of interviewees but almost all categories of information that were surveyed (biodiversity and ecosystem services) were required to some degree. Notably information on heritage conservation was an exception. Information on physical hazards such as flood and fire risk, biodiversity and tourism capacity were key issues for local governments across the case studies. In particular, Tier 1 (the lowest level of government) tended to put more priority and need more information on ecosystem services and socio-economic considerations generally than Tier 2, which was in turn more focussed on biodiversity issues than Tier 1.

All of the possible 'drivers' that might determine information needs that were identified in the survey were rated as important factors by the interviewees from all sectors. These included a statutory requirement to inform management decisions, a need for information for local policy formulation and a need to inform management decisions. Despite recognition of the importance of statutory requirements in driving information needs; local government interviewees tended to report a fairly low level of direct involvement in EIA and, especially SEA processes. This was particularly notable in the most local level of government (Tier 1). Nevertheless, the relatively low requirement reported for specific data types to inform EIA that was reported by Tier 2 as well as Tier 1 was a little surprising.

The number of decisions being made might also drive information needs. When viewed in terms of the area managed, it was evident that the individual stakeholders in the

farming and rural business category reported more decisions annually than the other categories. Further work in this area would be required for more robust interpretation that allows comparability between decisions. If this approach is to be used in future surveys, the 'decisions' need clear and specific definition.

The extent of involvement in the decision making process may also influence perceived needs. The survey indicated a disparity in the perception of the participatory process between local government and individual stakeholders. The stakeholders generally felt that they had little involvement and influence, whereas the local government responses reflected a perception that the mechanisms for engagement with local communities were in place. If individuals do find it difficult to engage with local environmental decision-making processes, this perceived disenfranchisement is likely to reduce their demand for information.

A reliance on Internet sources of information was reported across all government & other stakeholder categories and in all of the case studies. In contrast, there was a limited use of local survey data and especially of information from scientific survey. This raises the question of the quality and validity of information that may be being used to make decisions affecting environmental management right across the sample of case studies and should be noted as an important factor for emphasis in future work within TESS.

It was apparent that much of the information accessed by local governments was not stored on computers; even less was regularly updated or spatially referenced (i.e. mapped). Another point of interest, and importance for design of information systems, was that four of the stakeholder groups (especially hunting and nature-watching/reserve-management) were at least as active as Tier 2 governments in generating their own environmental information.

A substantial proportion of interviewees in all government and other stakeholder groups, and across all case studies, reported difficulties in obtaining adequate information for their decision-making purposes. Although biodiversity information at the National level (e.g. national figures for biodiversity and habitat) was relatively accessible, species and habitat data collated at the local & regional level appeared to be the most difficult category of information for interviewees to access.

Notably, the highest perception of these impediments to data access occurred in the stakeholder groups (local government & nature watching and reserves) that also indicated that greatest requirements for information. Perhaps the motivation of interviewees affected the likely perception of barriers. In other words, stakeholders who expressed little need for information were unlikely to encounter barriers to obtaining data.

Many potential barriers to obtaining adequate information were reported in the surveys and this occurred in all of the case study countries and all of the stakeholder groups. The most frequently cited problem was a difficulty in finding & accessing information. Other key issues encountered by the interviewees were the accuracy of the data, availability at an appropriate spatial scale, and the age of data.

1. INTRODUCTION

TESS aims to assist the integration of information about biodiversity and related environmental matters from the local level into planning and land-use decisions. At the same time it aims to encourage local people to collect such information in order to maintain and restore biodiversity ecosystem services. To achieve these aims, a decision support system will be designed to exchange information required in environmental assessments at all levels for information that benefits local recreation and livelihoods.

The project to design a Transactional Environment Support System TESS is therefore essentially about ensuring that environmental information, and especially biodiversity information, can be fed into decision making on land use at all appropriate levels. There is demand for information to comply with formal requirements for Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA), other planning and agri-environment schemes. TESS also concerns demand for socio-economic and ecological information needed in myriad informal decisions, made daily for livelihoods and recreation by local land managers, that impact biodiversity and ecosystem services. TESS concerns supply of information too, obtained by monitoring at local level and then collated centrally into the extensive GIS and other databases needed to fuel the decision support at all levels. Systematic guidance for informal local decisions has received relatively little attention in conservation, and therefore the information and monitoring needed to support them is an especially important feature of TESS.

This the aim of the first two scientific Work Packages of the TESS project, guided by an Administrative Work Package that runs throughout the project. Demand for information is being assessed by first describing flows qualitatively, by enquiry into formal top-down requirements in WP2 and for informal needs at local level in WP3¹. These two work packages determine who, in terms of organisations and institutions, provides what sort of

¹ The leaders of WP's 2 and 3 together with the Scientific Co-ordinator gave considerable thought to the question of how to distinguish between the environmental information requirements described in the two Workpackages and how best to relate them. The terms used in the Workpackages are 'central' and 'local' but these raise various immediate problems. The first is that where states have regional, provincial or other forms of devolved government and delegate EIA, SEA and land use planning to these sub-national levels there are really no central or national environmental information requirements arising from environmental assessment. The second is that under EIA and SEA the legislative or implementing authorities do not themselves require information but rather they set the policy and legal context within which developers or plan-making bodies must put together and present to decision-making authorities information relevant to the impact on the environment of what they are proposing. The third problem is to say what is really local: is it the lowest formal tier of governance or the level at which official decisions on proposals are made or is it individual landowners, NGO's or citizens' groups? If a farmer wants to continue receiving payments under the Common Agricultural Policy and wants to change his farming practice he may be taking a local decision but he has to apply to the body administering CAP payments in a national system and to provide such environmental data as may be required.

We suggest that in the light of these considerations the best way to make the distinction between the two WP's is one of perspective. WP2 looks at information from the point of view of **formal** systems, usually flowing from high government levels, while WP3 compares **informal** perspective under which individuals or groups (including NGO's or bottom level authorities) want to make decisions about land use for a whole variety of reasons. It is immaterial whether those in the latter category need approval at a higher level or not. What has also become clear is that often the information or data source for formal or informal decision making systems will be the same. Moreover these data sources may have been compiled by official bodies, partnerships between official bodies and the voluntary sector or indeed mainly by volunteers.

information to whom at present. Objectives of WP2, on the Central Policy Environment, were to identify information needs of governments across Europe for Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA), and other aspects of biodiversity conservation and sustainable development, and to determine how that information is obtained. Objectives of WP3, on the Local Environment, were to identify information needs of local government for EIA, of local communities for managing their environment and of individuals for land management decisions and to determine how that information is obtained.

A variety of information flows, analysis approaches and decision processes used for environmental assessment and sustainability assessment for biodiversity were identified by discussion with government departments (WP2) and by consultation within local case-study sites (WP3), across a range of 9 countries in which approaches were likely to differ. As the research on information requirements and flows was to be pursued by WP5 across all EU member states, for a more quantitative analysis to identify best practice that could be built into system design in WP6, the enquiry in WP2 and WP3 used standardised questionnaires (for completion by partners in WP2 and to guide structured interviews in WP3). This provided comparability between levels of government and across stakeholder groups at local level, and also tested questions for use in WP5. The aim was to identify questions that were not only easy to answer without ambiguity, but also which would reveal areas of environmental governance and use of information that vary enough across Europe to show relationships with environmental benefits.

2 WORK PACKAGE 2 - CENTRAL ENVIRONMENTAL INFORMATION

2.1 Introduction to Work Package 2

Work Package 2, entitled “Central Policy Environment”, had as its objectives

- To identify information needs of government for SEA, SIA and other aspects of biodiversity conservation and sustainable development.
- To determine how that information is obtained.
- To produce a report detailing the information flows from local and regional to central.

The first Task was for the TESS consortium to gather information on how data for these processes is managed in 4 to 5 states, if possible with different types of environmental governance. After preliminary analysis it was decided to focus on SEA and EIA at high level since these techniques are embodied in EU law as explained below, to ignore SIA (sustainability impact assessment) because this is not generally embodied in legislation, but also to include information needs related to biodiversity as it interacts both with land use planning, with the operation of the EU Common Agricultural Policy (CAP) and agricultural policy generally, and with Biodiversity Action Plans (BAPs) under Article 6 of the Convention on Biological Diversity (CBD).

The final two Tasks were to present the findings of the preliminary enquiry at a Workshop to which distinguished experts and stakeholders would be invited and to integrate the results into the present synthesis report with parallel results from Work Package 3 on local information needs.

2.1.1 Procedure and timetable

The procedure for this study was that ESUSG, the lead partner for WP2, first investigated (a) EU policy and legislation on EIA and SEA and (b) arrangements in the UK (England) for EIA, SEA, land use planning (LUP) and administration of the CAP as they affected the requirements for environmental, especially biodiversity, information to be collected and used in their decision making systems. This study was then presented to partners as a descriptive paper, together with a draft questionnaire designed to elicit similar information relating to the other countries listed above. The document was sent to partners in early February 2009 and discussed at a project meeting in Ljubljana in mid-March, when each proposed question was examined in detail by partners in order to test its feasibility for completion in relation to their country. A revised questionnaire was circulated at the end of March/beginning of April together with a completed return for the UK as an example to provide further guidance.

In the event returns for this enquiry were received from 9 partners relating to their countries, without regard to their type of environmental governance (Table 2.1).

Table 2.1. Responses were received for nine countries from the partners listed below.

Country	Organization
United Kingdom	ESUSG of IUCN/SSC
Turkey	WWF-Turkey
Romania	Danube Delta National Institute for R&D
Portugal	ERENA
Poland	Pro-Biodiversity Service
Hungary	Szent Istvan Univ, Inst for Wildlife Conservation
Estonia	IST, Tallin Univ of Technology
Greece	TERO Ltd
Slovenia	Centre for Cartography of Fauna and Flora

These countries were studied because TESS partners were available there to make the preliminary enquiries needed. They were not selected on the basis of representing a good cross-section of governance systems in Europe. Accordingly no conclusions should be drawn as to whether the findings are likely to be replicated for Europe as a

whole. Nevertheless they provide a number of valuable indications for the next stages of the project.

Partners were asked to complete the returns by 31 May 2009: the first was received in mid-May and the last in mid-October. As each return was received, any omissions or queries were discussed with the partners concerned. With some minor exceptions all returns were considered satisfactory and ready for analysis by the Game & Wildlife Conservation Trust (GWCT) to begin in the third week in July. This analysis was carried out by mid-August, thus enabling work on this report to begin, but only completed in late October when the last return was available.

2.2. Background

EIA and SEA in the context of biodiversity/environmental information requirements at governmental level: EU aspects

2.2.1 Policy and legislation at the EU level

The policy background provides a **framework** for the work of TESS which is essentially about designing an environmental information system which will be largely based on information provided by local land managers and used by them, but it needs to be seen in the context of environmental information needs at all levels. TESS is not designed as a general review of formal environmental assessment legislation which is already being carried out on a regular basis (EC 2003, COWI 2009a, COWI 2009b). Nevertheless it may throw some light on the strengths and weaknesses of existing arrangements, especially in relation to impacts on biodiversity and the availability or otherwise of information needed for the appropriate assessments.

The fundamental rationale for environmental assessment is that a coherent environmental policy, such as the European Union is committed to through the Treaties and various international obligations (e.g. WSSD 2002), requires that people who take decisions about proposals which will significantly affect the environment need to have the impact of these proposals on the environment assessed **before they are carried out**. By contrast, much environmental policy is concerned with addressing damage that has already occurred.

The EU has given this *ex ante* assessment policy legislative effect through 2 main instruments. They are the **EIA and SEA Directives**. For completeness we should mention that the Habitats, IPPC and Water Framework Directives also require similar assessments. However, this report focuses on the EIA and SEA instruments.

EIA and SEA are closely related instruments of EU law and policy. **EIA** is concerned with assessing the environmental impact of certain **projects** which are put forward by developers before they can proceed. **SEA** applies similar requirements to certain **plans and programmes** proposed by authorities. Originally the intention was to have one directive incorporating both levels, with SEA providing the broad framework and EIA the application of the policy to individual projects. Moreover, logically SEA should have come first: politics, however, dictated the reverse, with some undesirable consequences (Partidário 2007)

2.2.2 The EIA Directive and its amendments

Member states are required to ensure that EIA is carried out in appropriate cases by virtue of “Council Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain projects on the environment.” The original version was substantially amended by “Council Directive 97/11/EC of 3 March 1997”. This means that both documents have to be read together to understand the provisions. Further amendments were made in 2003 by virtue of Directive 2003/35/EC in order to incorporate the provisions of the Århus Convention on public participation. A consolidated version can be downloaded (<http://ec.europa.eu/environment/eia/sea-support.htm>). In English this is referred to as the EIA Directive although there is no reference to “environmental impact” in the official title.

2.2.3 Summary of the EIA Directive

A brief summary of the key provisions of the EIA Directive, 85/337/EEC as amended is as follows:

Article 1 gives the purpose as to assess the environmental effect of certain public and private projects which are likely to have a significant effect on the environment. It defines ‘project’ as either ‘the execution of construction works or of other installations or schemes’ or ‘other interventions in the natural surroundings or landscape’, including mineral extraction.

Article 2 requires member states to ensure that projects likely to have a significant effect on the environment by virtue of their nature, size or location have to obtain development consent and an appropriate assessment.

Article 3 says that “the environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 11, the direct and indirect effects of a project on the following factors:

- human beings, fauna and flora;
- soil, water, air, climate and the landscape;
 - material assets and the cultural heritage;” or on interactions between the foregoing.

Article 4 divides projects into two categories. Those in the first are listed in Annex 1 and must receive an EIA. Those in the second are in Annex II and in their case member states must determine whether EIA is required either on a case by case basis or by virtue of pre-determined thresholds. Article 4.3 provides that where case by case determinations are made or thresholds are set the criteria listed in Annex III should be taken into account.

Article 5 requires member states to ensure that developers (i.e. those making the proposal for the project) prepare environmental statements and include information about the project, its likely impacts, relevant data and alternatives covering the issues set out in Annex IV. Under this Article the competent authority (i.e. the one which can give or withhold development consent) must supply the developer with a list of the

environmental information required if the developer requests it. Alternatively member states are given flexibility to require competent authorities to supply this information whether or not the developer requests it.

Article 6 requires member states to designate authorities 'likely to be concerned'. These authorities must be consulted by the developer. These would be national or regional authorities for the matters relevant to environmental impact, such as national or regional nature conservation bodies. This article also covers the requirements for public participation once the application for development consent and the Environmental Impact Statement (EIS) are made public.

Article 7 deals with transboundary projects. Articles 8, 9, 10 and 10a are mainly procedural but spell out the right of the public to challenge outcomes of EIA's in the courts.

Article 11 provides for exchanges of information between the Commission and member states and requires the Commission to provide reviews including recommendations for any changes needed every five years.

Annex I lists the types of project definitely requiring EIA as oil refineries, thermal and nuclear power stations, nuclear reprocessing etc plants, iron and steel smelting plants, asbestos extractors, integrated chemical installations, long distance railway lines, medium to large airports, motorways and major roads, waterways and ports for large vessels, waste disposal installations for hazardous waste or large quantities of non-hazardous waste, very large groundwater abstraction and transfer schemes, large wastewater treatment plants, large sites for the extraction of petrol and gas, large dams and pipelines, very large buildings for rearing pigs and chickens intensively, large pulp and paper plants, large quarries and open cast mines, power lines over 15km long and petrol/petrochemical storage installations.

Annex II lists those other interventions which may call for EIA according to case by case analysis or because they exceed thresholds/meet criteria in categories, the first of which is

"1. Agriculture, silviculture and aquaculture

(a) Projects for the restructuring of rural land holdings;

(b) Projects for the use of uncultivated land or semi-natural areas for intensive agricultural purposes;

(c) Water management projects for agriculture, including irrigation and land drainage projects;

(d) Initial afforestation and deforestation for the purposes of conversion to another type of land use;

(e) Intensive livestock installations (projects not included in Annex I);

(f) Intensive fish farming;

(g) Reclamation of land from the sea."

This is followed by a long list of other categories involving extractive, manufacturing and infrastructure projects including all the types listed in Annex 1 which fall below any thresholds there given as well as further categories of what would normally be considered as substantial development.

2.2.4 Commission Review of the EIA Directive in 2003

The third 5-year review of the EIA Directive by the Commission pursuant to Article 11 was published in 2003 (<http://ec.europa.eu/environment/eia/eia-support.htm>). It has a summary and recommendations of 8 pages by the Commission with a 132-page Annex containing the full report, mainly compiled by consultants and based on questionnaires which were sent to the 15 member states at the time. This document reveals a great deal about the state of implementation in these member states, especially the wide variations in practice at those points in the Directive where discretion is permitted.

Overall the Commission found that not all new requirements arising from the amendments adopted in 1997 had been implemented fully, but they did not consider that any new amendments were called for.

The main specific points to emerge from the Commission's summary and recommendations were:

- The distinctions between Annex I (mandatory) and Annex II (for determination) projects were not causing problems: some member states had adopted a "traffic light" approach under which red means 'mandatory, amber means 'EIA may be required so that screening is needed' and green means 'EIA never required'.
- However where thresholds are set for Annex II projects there are very wide variations in these thresholds between member states, some taking the view that EIA should be applied quite widely.
- There is considerable variation in the extent to which member states keep statistics of the number of EIA's carried out and even where they do it is usually not possible to break them down by category (such as Annex I and Annex II). (NB The main report shows even larger variations in actual numbers recorded: for example 10-20 per annum in Austria compared with 6,000-7,000 in France, 3,000-4,000 in Sweden and up to 20,000 to 30,000 at regional level in Spain).
- Variations in requirements for scoping between member states are wide: those committed to it make it mandatory and some require draft scoping statements or draft EIAs to be available to the public.
- Arrangements, if any, to ensure the quality of environmental information also vary a great deal: some states provide for independent review of information supplied by the developer while others leave it to the competent authority.
- Without formal monitoring, which is not required, or research it is not possible to assess the impact of the EIA process on decisions.
- There is great variation in the emphasis member states put on the consideration of alternative proposals within an EIA submission: some allow other organizations and the general public to contribute to the selection of alternatives.
- The impacts of the Directive upon flora and fauna appear to be met, though it is unclear how far biodiversity is addressed. CBD guidelines are mentioned. (N.B. The main report at p.83/4 discusses this more fully and refers to some Dutch work to integrate biodiversity into decision making: it has not been possible to access this work.)
- Risk, access to justice and human health issues are noted and it is concluded that there are few measures on the part of member states to ensure quality control of EIA procedures.
- In conclusion the Commission recommend various steps to be taken by member states, including a precise form for recording and reporting and the introduction of quality control measures.

2.2.5 COWI EIA Report to the Commission of 2009

The consultants' study for the subsequent fourth Commission-led 5-year review of the EIA directive (COWI 2009a), became available shortly before this report was finalised. It covers all 27 EU member states, thus including 12 new member states who did not join the Union until after the previous review. At some 240 pages, including annexes, it is longer than the 2003 report but not in all respects more informative. Information was compiled by way of responses from governments in each member state using an identical survey form containing 47 questions leading mostly to qualitative responses and with scope for comment and additional material. A review meeting was held involving the Commission, representatives from member states and the consultants. In addition the main consultants appointed local consultants covering each member state who interviewed some local stakeholders or experts. The report of the Commission containing their own assessment and recommendations to the Council and Parliament was issued in September 2009: COM (2009)0378 final.

COWI point out that most if not all of the new member states had their own EIA legislation in force well before coming into membership and had aligned it to adopt the *Acquis* in good time. Thus they were no strangers to the requirements and generally made a smooth formal adaptation to the Directive. Their overall conclusion is that the Directive has come of age and is playing a valuable part in the application of environmental policy within the member states. Member states considered that the Directive ensured the application of environmental considerations to decision making (presumably meaning the cases to which it applies) and secured transparency in the relevant processes. They welcomed the increased public participation as a result of the 2003 amendments implementing the Espoo Convention. Interactions with the Habitats and Birds Directives and Biodiversity Action Plans were not considered to present major problems, though the issue of cumulative proposals and the Directive's weak application to agricultural biodiversity was noted (presumably meaning 'wild biodiversity found in land managed for agriculture').

COWI asked member states for statistics on the number of EIA's carried out annually for each of the years 2002 to 2006, including a breakdown between Annex I and Annex II cases where available, and have presented the results in tabular form. The figures are not easy to interpret, partly because of incompleteness. Nor is there any attempt to relate them to those produced in the previous 5-yearly review (EC 2003). Austria remains at the bottom end of the number of annual cases reporting 25-30 annually as compared with 15-20 in 2003; Sweden has 1,600 as compared with 3-4,000 reported previously and France reports 5,000 annually compared with 6-7,000 in 2003 (see paragraph 4.3 above). These numbers scarcely support COWI's comment that the general trend in the number of cases is upward. Moreover the position in Spain is rather obscure. In their table 6.2 COWI present the overall Annex I numbers for the years 2002-6 as being 73, whereas the sum of the number for each year shown in the following columns is 585 or an average of 117 per year. No figures were available for regional cases between 2002 and 2006 but in the 2003 review an estimate of 20-30,000 was given for these cases. In relation to some countries a distinction is made between full EIA's and simplified cases. In Greece 1,100 cases annually are decided at central government level, while at regional level there are estimated to be 2,000 cases annually.

While one reason for different numbers of cases between countries of roughly equal population is that the thresholds for application to cases under Annex II may be set

higher or lower, this can hardly account for the huge variations implied by the figures given. It seems surprising that after four 5-yearly Commission reviews of the operation of the Directive by the member states, we are still no nearer to having a satisfactory explanation for this situation or any assessment of its implications for the fulfilment of the objectives of the legislation. No-one would imagine that Greece is seeing around one hundred times as many projects needing EIA put forward annually as Austria, so it would seem to follow that the objectives of environmental assessment are being achieved in rather different ways in the two countries.

Notwithstanding their generally positive endorsement of the operation of the Directive the consultants noted some outstanding problem areas affecting its contents as such rather than member states' application of it. These were:

- Screening - inter alia, the use of thresholds
- Transboundary consultations - different procedures applied in the various Member States
- Quality control
- Monitoring.

Not all of these are directly relevant to TESS but some are. As previously explained, "screening" is the process to determine whether a project falls within the definitions governing the application of the Directive or national legislation applying or extending it. These determinations do not depend on the availability of environmental information as such. Nevertheless in the discussion of difficulties with screening there is an interesting reference to an electronic system devised in Denmark to enable applicants to judge whether their proposals for intensive pig farming require EIA and to show how with various modifications they can so mitigate their plans as not to cause significant impact on the environment. Although other member states are reported as not finding the system very helpful in their situations it appears to be an example of environmental data being incorporated into a predictive model to enable local land managers to benefit both themselves and the environment. This is therefore a similar approach to that of TESS, albeit in a specialised area.

In considering quality control the consultants say that the lack of a requirement in the Directive to undertake reviews of the quality of EIA reports means that their quality is uneven and may lead in some cases to development consent being given on the basis of inadequate information. They add: "Many Member States point to the fact that lack of sufficient quality in data employed in EIA reports is a problem." They recommend that member states should be required to undertake continuous quality control of EIA reports and suggest that this could be done either by vetting the authorities or consultants who provide the reports or by having independent reviews. The authors of the present report had reached a similar conclusion before seeing the COWI report and see scope for amendment to the Directive accordingly.

The lack of a requirement for monitoring EIA projects once approved is a further weakness of the Directive noted by the consultants, a view also shared by the present authors. Since the SEA Directive has such a provision in Article 10 the omission is all the more glaring. In practice, as found by the TESS WP2 preliminary enquiry, monitoring is required or encouraged in all the countries studied so amending the Directive on these lines should not be a controversial provision.

The consultants consider the aspect of regulatory simplification by saying “One way of achieving regulatory simplification would be to consider consolidating the EIA and SEA Directives for the purpose of clarifying their inter-relationship, to ensure more consistency between both pieces of legislation and to harmonise the key stages and elements of EIA and SEA. Key stages and elements would include the examination of reasonable alternatives as mandatory; establishing of monitoring measures as part of the environmental information; and efficient integration of quality management elements and reviews of the environmental information.” There is much to be commended in this approach and the key elements proposed for it, which, as the consultants, say does not mean that every part of the two processes should be identical, not least because of differences of scale. However they report that a majority of member states do not favour harmonization, though the reasons for this are not given.

Although the consultants have no specific recommendations about the links between EIA on the one hand and the Habitats and Birds Directives and the EU Biodiversity Action Plan on the other, it is of interest that they were asked to look at this topic by the Commission and to consider their findings. While there is no formal link between the provisions of Article 6 of the Habitats Directive and the EIA Directive some member states have enacted such a link. In either case it is clear that Article 6 requires an appropriate assessment where a project is likely to have a significant negative effect on a Natura 2000 site (this includes sites designated under the Birds Directive) with regard to the conservation objectives of the site, while the EIA Directive requires an environmental assessment of any project (as defined) which will affect the environment (as defined). Thus in the case of a project requiring EIA and affecting a Natura 2000 site both Directives will be triggered, whereas a project not requiring EIA (e.g. because of its size) will still require assessment under Article 6 if it is likely to damage a Natura 2000 site. Basically EIA assessments are wider than Article 6 assessments, while the latter are deeper as regards the specific species and habitats objectives of the designated site.

While member states consider that it is possible to run both procedures together by using the same or similar material in the assessments and that confusion or complication for developers are generally avoided, some point out negative aspects. These include the fact that where neither EIA nor Natura 2000 apply the requirements for assessment of nature conservation aspects may be absent when a project is considered for development consent and, more importantly, that EIA has very little application to the management of agricultural or forestry lands. By way of comment it can be said that the former problem is in the hands of member states, since there is nothing to prevent their domestic land use planning law requiring strong consideration of biodiversity. It is also disappointing that the consultants were not asked to investigate the extent to which the Annex 2 paragraph 1 provisions of the Directive, which do apply to agricultural intensification and related matters subject to discretionary thresholds, are being applied in practice. This issue is discussed later in this report.

In their report to the Council and the Parliament, the Commission generally endorse the findings and recommendations of COWI as set out in B 4.12 to 14 above. They recognize that there are improvements which could be made and refer to more express references to climate change and biodiversity. The context for any change seems to be when general proposals for simplification of legislation are considered. The possibility of merging the EIA and SEA Directives is ruled out.

2.2.6 The SEA Directive

We can deal more briefly with the parallel regime, SEA. The relevant legislation is “Directive 2001/42/EC of the European Parliament and the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment”. A summary of key provisions is as follows:

Article 1 gives the objective as “to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the adoption of plans and programmes with a view to promoting sustainable development, by ensuring thatan environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment.”

Article 2 defines ‘plans and programmes’ as those prepared by a national, regional or local authority or through a legislative procedure or which are required by legislative, regulatory or administrative provisions.

Article 3 sets out the scope as plans and programmes likely to have a significant environmental effects and says this will include all those which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use and which set the framework for projects subject to the EIA Directive. There is an exception for plans affecting small areas or minor modifications, unless they are deemed to have significant environmental effects. Plans and programmes likely to have effects on sites designated under articles 6 and 7 of the Habitats Directive, 92/43/EEC, are also subject to SEA.

Later articles combined with the Annexes set out the information required about the impact of the plans and programmes on a list of ‘objects’. In contrast to the EIA Directive the aspects of the environment which the plan or programme may impact upon are listed in the Annex and the topics are slightly reworded and expanded compared with those in the EIA directive. For example “biodiversity” is mentioned as well as “flora and fauna”, but it is doubtful if it means something different. “Human health” is specifically mentioned rather than “human beings”.

2.2.7 COWI SEA Report to European Commission of 2009

In parallel to their report to the Commission for the fourth 5-yearly review of the EIA Directive COWI consultants carried out a similar review of the operation of the SEA Directive, this being the first such review since the Directive came into force in 2002 (COWI 2009b). The methodology was also similar to that used for the EIA review.

On the overall effectiveness of the Directive COWI’s findings were broadly similar to those in their EIA report, i.e. that it was providing a structured contribution to decision making in the planning process from an environmental perspective and increasing the transparency and participatory character of such decision making processes. No major problems of transposition or implementation were reported, though it was remarked that these were relatively early days and that comparisons between practice in different countries in order to learn lessons were difficult because of the lack of experience and recorded information. COWI on the other hand considered that the wording of Article 3

(2) (a) allows a great deal of flexibility to member states in deciding on the application of the Directive. This indicates the types of plan to which the Directive applies, such as those for agriculture, transport etc, but adds a further criterion which is that the said plans “set the framework for future development consent of projects listed in Annexes I and II to [the EIA] Directive”.

On matters of more direct relevance to TESS the consultants pointed out that when it comes to scoping, i.e. deciding what environmental information is need for the environmental report which is at the heart of the assessment, there is a significant lack of good quality environmental information in the member states, as well as uncertainty about the level of detail needed for baseline data in strategic documents. They were also concerned at the absence of a standard set of environmental and sustainability criteria and of guidance on impact forecasting. They found that in practice most member states use qualitative or a mixture of qualitative and quantitative methods. Monitoring of plans and programmes and programmes subject to SEA was described as both a “non-issue” and a “general problem”, which appears to mean that member states had little say about it in response to the questionnaire, rather than that it is of no account. By contrast consultation of the public is considered by governments to be well-developed, though this view was not always shared by the public themselves.

As in the case of the EIA review member states are reported as considering that links with the Habitats Directive and the EU Biodiversity Action Plan are generally satisfactory, though some NGO’s differed. Member states’ more detailed views on the SEA Directive were reported as being:

- Expensive mitigation measures can be avoided because the iterative process of SEA’s gets environmental considerations into plans early;
- Generally plans are “greener”;
- Consultation between different public authorities is improved;
- Transparency in decision making is increased;
- Compliance with specific environmental policies is assisted;
- What is relevant to environmental issues is brought out.

Member states considered it too early to envisage amendments to the Directive but COWI pointed out that the need to secure alignment with the SEA Protocol, to which the EU is a signatory, will require some changes. In this case they suggest some limitations to the discretion afforded to member states under Article 3(2)(a), spelling out how the scoping process should be managed and clarifying the monitoring and plan implementation aspects, though they raise the question as to whether the difference between northern and southern planning cultures in the EU would make this feasible. In addition they see advantages in consolidation of the EIA and SEA Directives or, going further, a completely unified environmental assessment regime in the EU.

The Commission’s questionnaire produced a varied and somewhat patchy response relating to the volume of SEA’s being conducted in each member state. Some countries reported cases completed, others cases in progress and yet others gave details of screening applications which in many cases presumably did not lead to actual SEA’s. Generally there was better reporting of the use of SEA in the land use planning system than in other sectoral planning regimes, while the majority of SEA’s also appear to relate to land use planning.

Finland had the highest number of SEA's with around 1500 for land use plans and 10 for other sectors. Austria reported an estimated 200 SEA's in 2007, though different figures were reported to the "SEA Working Group": this contrasts with Austria's very small number of EIA's annually. At the same time there were 300 SEA screening procedures in the Austrian province of Salzburg, compared with only 20 in Vorarlberg. France had an estimated 400 cases of SEA for land use plans in 2007 and were aware of 40 cases in other sectors, though this information was not complete. No statistics are kept in the UK, as mentioned in C 4.2 of this report, but officials supplied an estimate of 400-500 cases in process to the Commission's enquiry – compared to a figure of 600-700 given to one of the author's of this report. Some countries with fewer SEA's have correspondingly precise statistics, e.g. Bulgaria 109, Czech Republic 12, Spain 10 at national level, Estonia 165 (of which 16 at government level). In a number of federal countries statistics, if there are any, are kept federally, making a national picture hard to obtain. All that can be deduced from this rather sporadic information is that there are likely to be wide differences in the application of the Directive between member states. While it is easy to understand why member states might be granted a lot of flexibility in applying the Directive the lack of a requirement to keep accessible records is a substantial hindrance to analysis of the strengths and weaknesses of this instrument of environmental policy and thus to potential improvements of its effectiveness.

The Commission's report to Council and the Parliament on the SEA review , COM (2009) 469 final, again endorses the views of COWI as set out in B 5.6 above, except on the desirability of merging the EIA and SEA Directives. They note that adoption of the SEA Protocol would require the application of SEA to policies as well as plans and programmes and indicate that that process would give scope for some improvements such as limiting the wide discretion of member states on process, including public participation.

2.2.8 General considerations arising from the EIA and SEA Directives

The SEA Directive has some interesting features. One is a requirement for **mitigation** if the likelihood of damage is assessed (and compensation if mitigation is not feasible) and a second is **monitoring** as the plan is implemented. The reference to **sustainable development** in Article 1 appears to reflect the timing of the Directive after the Rio Earth Summit. However the impact report required is strictly environmental. There is no suggestion that it can be tempered by social and economic considerations, even though in reaching a decision the competent authority can consider these essential components of sustainable development.

We can say that **EIA applies mainly to one-off infrastructure projects**, which generally affect fairly small areas of land. What is not clear is how the number of EIA's can vary so much between member states of similar population size. One explanation is the level of the thresholds for application set by different member states under Annex II but this does not seem sufficient and it seems surprising that this has not been investigated further by the Commission. Moreover different orders of figures for the same countries in the 5-year Reviews add to the uncertainty. It was stated in the Commission's 2003 Review that there were up to 30,000 EIA's per year in Spanish regions which would suggest that EIA was being applied to cases well beyond what is strictly required by the Directive. However the 2009 Review (European Commission

2009a) puts France at the top of the EU league with some 5-6,000 cases per year, with Spain only reporting 320. It may be that where there are relatively large numbers of cases these would in some other member states be part of the normal land use planning system and would require the consideration of relevant environmental impacts but without the full and formal procedures required by the Directive. This seems to be the position in the UK, for example. **SEA on the other hand applies to a wide range of plans**, including very big ones such as regional spatial or land use plans covering millions of people and thousands of square kilometres of countryside. Obviously such a plan and the SEA which is required will be wide rather than deep. However SEA's can be applied to quite small areas such as urban neighbourhood renewal plans and to waste disposal or transport plans which are as much about types of activity as about land use changes.

Without going into the detail of all the procedures for operating the Directives, it is relevant to draw attention to three terms that are central. The first is **"screening"**, which means establishing if one or other of the Directives apply. A huge effort goes into this but it is not of direct concern in TESS since the matter is not resolved by the presence or absence of environmental information but by the interpretation of the definitions in the Directive or those adopted by member states using their discretion (i.e. Annex II cases). The second term is **"scoping"**. This is important for TESS because it means establishing what environmental information is needed for the assessment, what baselines if any exist, and what can be collected in the time available. TESS is essentially about designing a system for new and readily accessible databases of environmental (and socio-economic) information to support decision making at whatever level is required. The third term is **"consultation"**. The proposer of the project or plan must consult certain **designated environmental authorities**, (e.g. government agencies for nature conservation, countryside, water management and the built heritage) about scoping and then all the way through. Secondly **the public**, including NGO's, must be consulted and in such a way that they can, if able, be a source of data input, as well as just expressing their views at each stage of the SEA or EIA.

2.2.9 Current arrangements and plans at EC level

DG Environment is responsible within the Commission for EIA and SEA, while within the DG responsibility falls to Unit D.3, Cohesion policy and Environmental Impact Assessments. An important resource on EIA/SEA is the relevant part of the **DG Environment website**: <http://ec.europa.eu/environment/eia/home.htm>. This contains separate pages for EIA and SEA, each containing introductions, relevant guidance documents from the Commission, legal texts, research and other reports. These include all previous EIA 5-year Review reports including the latest and the first SEA report published. A list of government contact points and research centres is included, though it may not be up to date in all respects. Within DG Environment contact has been made with Unit G.1 on Land Use Modelling (in particular in the context of Climate Change Adaptation and Ecosystem Services), and those who are working on The Economics of Ecosystem and Biodiversity (TEEB) project.

2.2.10 Related Impact Assessment Tools

It should be noted that Sustainability Impact Assessment (SIA), which is mentioned in the DoW is not a formal legal concept within EU environmental policy. However it is being developed as a policy instrument relating to land use by the FP6 Project SENSOR (<http://www.sensor-ip.org/>) which has not yet concluded. Note that it, like TESS, is a decision-support tool. SIA has been applied to other EU policy areas such as trade relationships with developing countries. Sustainability Appraisals in the UK are tools for examining the impact of plans etc on sustainable development. The acronym SIA is also used within the International Association for Impact Assessment (IAIA) to denote Social Impact Assessment. The IAIA are developing the concept of a family of environmental assessment/impact assessment tools to include Technological IA, Cumulative IA, Health IA and Ecological IA, as well as EIA, SEA and SIA (Partidário 2009).

2.3 EIA, SEA and Land Use Planning in the context of biodiversity/ environmental information requirements at governmental level: UK aspects as an example.

2.3.1 Regulations in the UK implementing EIA and SEA Directives

The EIA and SEA Directives are implemented in the UK through separate sets of regulations within each of the devolved administrations (England, Wales, Scotland and Northern Ireland). These regulations apply the Directives in full (i.e. they do not attempt to paraphrase or interpret them) and deal with those aspects of the Directives where the member states have discretion, such as procedural matters and the way in which Annex II of the EIA Directive is applied using thresholds or the case by case approach.

In the case of EIA, as well as separate general regulations for the four administrations, there are regulations for a number of specialized regimes such as those dealing with harbours, highways, transport schemes, pipelines, decommissioning of nuclear power stations and so on. It has not been possible to examine all of these regimes, but for EIA the focus in this description will be on the application of EIA to proposals for development under the Land Use Planning (LUP) system (officially called Town and Country Planning in the UK) and to one specialized regime that is especially relevant to biodiversity: restructuring of agricultural holdings and conversion of semi-natural habitat to intensive agriculture (see Annex II paragraph 1 of the EIA Directive).

An important aspect is the naming of the mandatory consultation authorities– these differ from one devolved administration to another but in England they are currently the Environment Agency (pollution and water quality), Natural England (biodiversity and access to countryside) and English Heritage (built environment). The regulations applying to England deal with any cases involving UK-wide or international aspects. In Scotland the SEA regulations extend the application of SEA beyond the requirements of the Directive by bringing ‘strategies’ within its scope, as well as plans and programmes.

For convenience this paper will not describe further differences in the various devolved arrangements but will use the arrangements for England or the UK as a whole as examples for the purposes of TESS. The general effect of the regulations is that where projects or plans require environmental assessment in terms of the Directives they cannot receive development consent under the land use planning system or approval

under the special consent regimes for harbours, highways etc unless the assessment has been properly carried out.

It was noted in the Part A paper that paragraph 1 of Annex II to the EIA Directive lists as projects to which EIA may apply the restructuring of rural landholdings and the conversion of uncultivated land and semi-natural habitats into more intensive farming regimes. This provision has given the UK authorities some difficulty since such activity would not be caught by the normal LUP system but originally no steps were taken to implement it. The first regulations were made in 2001, but apparently not considered adequate, and so further regulations were made in 2006. These are called “EIA (England) (No.2) Regulations 2006” and Guidance about how they work has been issued by Natural England, who also administer them as the competent authority. The Guidance explains that consent is needed in two cases:

- a) projects which increase the productivity for agriculture of land not cultivated for the previous 15 years; or
- b) projects which restructure rural landholdings, e.g. by removing more than 4km of hedges or other field boundaries or recontouring the land by moving of over 10,000 cubic metres of earth or affecting over 100 hectares (NB lower thresholds apply in designated landscape areas).

If such work is done without consent the farmer can be required to carry out restoration and may lose some (or all) of the CAP subsidy he or she is due under the “cross-compliance” rules (see below). No consents have yet been given under these regulations.

Such controls as apply to farmers more generally when they wish to change the use of their land for agriculture within the CAP payment regime, now known as Single Farm Payments. Almost all farmers receive such Payments and thus subscribe to rules which require consent from the relevant government agency, Natural England, if they make significant changes in the management of their land. Consent will involve consideration of the environmental impact of the changes, including the impact on biodiversity. In addition receipt of a Single Payment in the first place will require what is called “cross-compliance” with a series of environmental rules. This regime gives rise to the question as to how Natural England sets the rules for cross-compliance and for consenting to changes of land management and where the data that determines whether the national level rules apply in particular cases is to be found.

2.3.2 UK official guidance on the SEA Directive

A number of official publications in the form of Departmental Circulars and guides provide valuable insights on how the various parties involved in environmental assessments are meant to go about their business. The Natural England Guidance on the EIA regulations for agriculture just mentioned is one special example. It is not feasible or necessary to list or describe them all, but one of the most informative (Anon 2005), is available at:

<http://www.communities.gov.uk/publications/planningandbuilding/practicalguidesea>. This represents official guidance on the SEA Directive at UK level.

The “Practical Guide” contains sections on background and context, consultation, SEA

and sustainable development and the stages of SEA, backed up by 10 appendices offering more detail and useful figures and diagrams and a comprehensive list of references and documents for further reading. The section on consultation indicates that as well as giving their opinions the public may be able to provide valuable information. The section on the stages of SEA sets them out as follows:

Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope.

Stage B: Developing and refining alternatives and assessing effects.

Stage C: Preparing the Environmental Report.

Stage D: Consultation and decision making.

Stage E: Monitoring and implementation of the plan or programme.

Relevant environmental information, including biodiversity information that can be assembled in a reasonable timescale is essential for stages A and B and will, if it is effectively included, then influence the remaining stages. “Relevant” here means that it is important at the scale of the plan or project and that it relates to a likely significant impact of the plan or project. Thus a complete and very detailed state of the environment report for the area affected will not be useful because it will not be manageable for the decision-making process. Detailed guidance and examples relevant to TESS are given in the following Appendices:

Appendix 3 – Collecting and presenting baseline information

Appendix 4 – Sources of baseline information

Appendix 5 – Developing SEA objectives, indicators and targets

Appendix 6 - Developing and assessing alternatives

Appendix 7 – Prediction and evaluation of effects.

Appendix 3 explains that both quantitative and qualitative information may be included, but the latter must be based on evidence, not guessed, and that trend information which can indicate scenarios with or without the plan or project is especially important. Most information will already exist in some form but fresh surveys may be needed where an issue is important and data is lacking. Appendix 4 lists a wide range of official and voluntary bodies that hold environmental information relevant to the assessment process and website links: many of these relate to biodiversity and landscape. Among the examples given in Appendix 5 are some SEA topic objectives, targets and indicators relating to biodiversity. For example:

<i>Objective</i>	<i>Indicator/target</i>
Maintain biodiversity, avoiding irreversible losses	achievement of Biodiversity Action Plan targets
Ensure sustainable management of key wildlife sites, SSSI's.	reported condition of nationally important sites.

Appendix 7 suggests that the most likely prediction and evaluation technique will be in the form of a table with columns for objectives, targets, quantification of effects, likely change over time (positive or negative) and comments. It also lists other prediction techniques and sources of information about them as follows: expert judgment, public participation, Quality of Life Capital, geographical information systems, network analysis, modelling, scenario/sensitivity analysis, multi-criteria analysis, carrying capacity and ecological footprints and compatibility assessment.

Therivel 2004 is an influential book describing SEA in practice with many examples and written by a leading researcher/academic in the field. It was published at the time that the Directive was coming into force in the UK and therefore does not address problems arising from its application.

2.3.3 The UK land use planning system and biodiversity/environmental information

Whether or not EIA or SEA are required in particular cases, all significant development (i.e. construction or changes of use of land, except changes in agricultural or forestry practice, horticulture or gardening) requires consent of the relevant local or national authority, unless a general exemption, e.g. for small additions to buildings, has been given. This consent is usually referred to as “planning permission”. In addition authorities are required to prepare planning frameworks at regional and local levels, currently called Regional Spatial Strategies and Local Development Frameworks in England. Both the individual planning decisions and the frameworks are required to take account of national guidelines set out by the Department of Communities and Local Government in the form of Planning Policy Statements (PPS).

PPS9 deals with Biodiversity and Geology Conservation and begins with a statement of key principles:

(i) Development plan policies and planning decisions should be based upon up-to-date information about the environmental characteristics of their areas. These characteristics should include the relevant biodiversity and geological resources of the area. In reviewing environmental characteristics local authorities should assess the potential to sustain and enhance those resources.

(ii) Plan policies and planning decisions should aim to maintain, and enhance, restore or add to biodiversity and geological conservation interests. In taking decisions, local planning authorities should ensure that appropriate weight is attached to designated sites of international, national and local importance; protected species; and to biodiversity and geological interests within the wider environment.

(iii) Plan policies on the form and location of development should take a strategic approach to the conservation, enhancement and restoration of biodiversity and geology, and recognise the contributions that sites, areas and features, both individually and in combination, make to conserving these resources.

(iv) Plan policies should promote opportunities for the incorporation of beneficial biodiversity and geological features within the design of development.

(v) Development proposals where the principal objective is to conserve or enhance biodiversity and geological conservation interests should be permitted.

(vi) The aim of planning decisions should be to prevent harm to biodiversity and geological conservation interests. Where granting planning permission would result in significant harm to those interests, local planning authorities will need to be satisfied that the development cannot reasonably be located on any alternative sites that would result

in less or no harm. In the absence of any such alternatives, local planning authorities should ensure that, before planning permission is granted, adequate mitigation measures are put in place.”

It will be seen from these principles that information about biodiversity is regarded as integral to the operation of the planning system that the rules favour plans and projects which enhance biodiversity and that the principles are very close to those embodied in the EIA and SEA Directives. The remainder of PPS9 applies the principles to the regional and local frameworks already mentioned, to the hierarchy of sites of conservation importance from the international to the local and to species protection. These controls do not however apply to any changes of use or management of land in agriculture or forestry or semi-natural habitats which are not caught by the planning system: in other words most of the countryside.

Official guidance on the operation of PPS9 relevant both to the general planning system and to formal environmental assessment can be found at <http://www.communities.gov.uk/publications/planningandbuilding/planningbiodiversity> (Anon. 2006). This asserts the need for an information and evidence base and outlines key elements of such a base including the character of an area, any priority species and habitats it might contain and so on. It then describes possible sources of biodiversity and geological information under the following headings:

1. Natural Areas and Joint Character Areas: these are map-based classifications of areas according to their main characteristics relevant to biodiversity and countryside/landscape issues. They were devised by the former English Nature and Countryside Agency, bodies which have recently been merged into a new agency, Natural England, which is one of the statutory consultees under the SEA Directive. So, for example, in the County of Northumberland there are four main Natural Areas, the coastal plain, the sandstone lowlands, the Cheviot fringe and the Cheviots (upland pasture and semi-natural land).
2. Information on natural systems – data for which might be captured in river catchment and flood management plans, coastal management plans etc.
3. Hierarchy of designated sites – ranging from Natura 2000 and Ramsar sites to National Nature Reserves, Sites of Special Scientific Interest (SSSI's) and Local Nature Reserves.
4. National Geographic Information Systems (GIS) – these are being developed by government and adopted by local authorities to assist the planning process. For example, in July 2002 a partnership of Government departments and agencies launched MAGIC, a web-based interactive system which allows users to view and query area maps displaying key environmental designations via a standard GIS (www.magic.gov.uk). It provides a good single source of information on designated and other sites and management boundaries, including SSSIs, Areas of Outstanding Natural Beauty and RSPB reserves. In some cases local authorities have incorporated MAGIC data into their own systems.
5. The National Biodiversity Network (NBN) – the NBN Gateway is a computer system providing a single point of access to a wide range of biodiversity information relating to species and habitats and held by different owners in various formats and with varying

degrees of coverage, mostly based on records compiled by volunteers (www.searchnbn.net).

6. Information on the effects of climate change – for example the MONARCH project, run by Oxford University's Environmental Change Institute, is modelling predicted movements of species and future locations of biodiversity in the UK.

7. Information on ancient woodlands – inventories of ancient woodlands can be downloaded from MAGIC or the Natural England websites.

8. Mapping networks of natural habitats – these are described as “opportunity maps” to show where priority habitat could be restored or re-created. Some examples are the East of England Regional Biodiversity Map using land use data sets (LDU), the OWLS map of land of biodiversity interest for the county of Oxfordshire and the RSPB project “Making Space for Wildlife”.

9. Biodiversity Action Plans – the basis is the UK Biodiversity Action Plan (Anon. 1994) published as a national response to the Convention on Biological Diversity signed at the Earth Summit in 1992 (www.ukbap.gov.uk) . Under the Plan some 400 species action plans, 45 habitat action plans and 160 local biodiversity action plans have been developed. They are key sources for information on priorities and any action being taken to implement them. Regional and local BAP's are usually run by partnerships of statutory and voluntary bodies and stakeholders and have created their own dynamism. They may have also created local site systems.

10. Local record centres – where these exist and are operational they are valuable in providing a single port of call for information which would otherwise be held separately and they can provide a link to the NBN Gateway mentioned above. The Guide recommends all local authorities to support such centres.

11. Local authority ecologists – where these are employed they are a focal point for meeting information needs.

12. Community knowledge – as an example the Dartmoor Nature for Real project provides an example of good practice in finding out not just what people know about their natural environment but which aspects they value and wish to see supported through the planning process.

The foregoing examples set out in the Guide show that a large amount of biodiversity information is potentially available to influence decisions under the planning system. However in spite of major efforts over the last two decades to co-ordinate it and to make it accessible to the non-specialist, there is a long way to go if these objectives are to be achieved. Moreover there are still very large areas of land not covered by designations where biodiversity data is virtually non-existent and many land use decisions not controlled by the planning system where even if there was data there is no requirement to apply it. These are issues that the development of TESS will seek to address.

2.3.4 Governmental contact points and UK overall statistics for EIA's

The national focal point for EIA and SEA policy and implementation as well as for the operation of the systems in England is the Department of Communities and Local Government (DCLG) (www.communities.gov.uk), while the contacts for EIA and SEA are within its Planning Directorate. The Department of the Environment, Food and Rural Affairs, Defra, (www.defra.gov.uk) are responsible both for biodiversity and for agricultural, fisheries and forestry policy. Defra has a contact point for the EIA regulations for agriculture, while Natural England has a contact point for its role as a statutory consultee on SEA.

Kim Chowns of DCLG has supplied overall UK statistics for EIA under the various consent regimes, going back to 1991 where available. A summary of these is in Table 2.2 and shows that while the number of cases varies from year to year it has recently been around 300 to 550. In relation to SEA's Kim Chowns reports (pers.comm.) "We have not compiled figures for SEAs. Annual figures are difficult here as SEAs are carried out in parallel with the preparation of plans/programmes, and hence tend to spread over more than one year, but our information is that currently between 600 and 700 are under way across the UK."

ENVIRONMENTAL IMPACT ASSESSMENT IN THE UK TO 31/12/2005				
Table 2.2: Environmental Statements (ESs) in the UK				
Year	GB planning consent system	GB other consent systems	DOE(NI)	Total
1991	214	90	11	315
1992	225	83	11	319
1993	226	114	29	369
1994	229	119	27	375
1995	208	91	23	322
1996	174	88	12	274
1997	185	91	25	301
1998	190	64	21	275
1999	303	89	13	405
2000	459	102	39	600
2001	448	126	44	618
2002	485	165	50	700
2003	437	98	62	597
2004	475	88	64	627
2005	555	109	35	699
2006	363	0	0	363
2007	313	0	0	313

2.4 Enquiry on 'Formal' or National Level information carried out by TESS Partners

Partners taking part in the study were given introductory guidance. For a fuller description of the EU requirements for EIA and SEA and of formal decision making systems in the UK they were referred to the accounts in what are now sections 2.2 and 2.3 of this document.

Taking the UK as an example, four general*categories were distinguished under which biodiversity information is required to be incorporated into formal decision making systems. These are:

- a) EIA of projects
- b) SEA of plans and programmes
- c) Proposals needing consent under the land use planning (LUP) system
- d) Payments under the Common Agricultural Policy and national environmental schemes for agriculture.

In the case of (a) to (c) biodiversity information would only be needed where the proposal is expected to have a significant effect on fauna and flora or biodiversity.

In the UK arrangements for all four categories mentioned are 'devolved', which means that for England, Wales, Scotland and Northern Ireland the following instruments are done differently (even if only slightly) :

- i) laws and policies for land use planning;
- ii) regulations implementing the EIA and SEA directives;
- iii) official guidance to local authorities operating the LUP system;
- iv) practical guidance from official sources as to how to prepare or comment on EIA's or SEA's and how to take account of biodiversity in LUP applications.

However databases of biodiversity information may not be so divided but may cover the whole of the UK or at least more than one part of it. In a similar way unofficial guidance prepared by experts or NGO's and research studies may apply to the UK as a whole or just part of it.

For TESS purposes at this stage it was not necessary to understand or compile data about all the sub-national variations of laws, guidance, databases etc in any one country but information was sought on:

- a) at what governmental level the laws/regulations are made;
- b) for that level how the system works in one reasonably typical case; and
- c) about sources of biodiversity information and research/analysis related to EIA's or SEA's which is relevant to TESS, which may cover wider areas of the country.

Therefore if a country makes the relevant laws, regulations or rules at national level then that level was the one about which information was sought. On the other hand, if a country has devolved EIA, SEA, LUP and CAP administration to its regions or provinces

* NB appropriate assessments are also need for impacts on Natura 2000 sites and under aspects of the Water Framework Directive.

and has 10 such areas then information was wanted about the formal systems for just one of them – but information about databases, unofficial guidance and research/analysis could relate to wider areas.

2.4.1 National Enquiry Template: analysis of returns

2.4.1.1 Preliminary comments on governance systems

Among the group of countries studied the UK and Turkey stand out from the rest for different reasons. Turkey is not yet a member of the EU and has not therefore adopted all existing EU environmental legislation, though it is a candidate state and is moving towards adaptation. In the context of this study it should be noted that Turkey has not legally implemented either the SEA Directive or any parallel system, though the decision to adopt the Directive was taken in 2002 by the Ministry of the Environment and implementation is foreseen for 2010 (Unalan & Cowell 2009). Secondly although agriculture is very important to Turkey, providing some 30% of jobs and 8% of GDP, and a host of measures are in train to align agricultural policy with the EU's CAP, the overall target for such alignment is around 2013-2014. Thirdly Turkey's administration is considerably more centralised than that of other countries in the study or the rest of the EU. Provincial governors and regional divisions of national ministries play an important role and often exercise powers which elsewhere belong to elected local government bodies. This is not dissimilar to the 'old' arrangements in France where prefects appointed by central government had major responsibilities.

The UK is different from the others because it has a national UK-wide elected parliament in Westminster which controls foreign, economic and immigration policy for the UK as well as domestic policy for England, while 'devolved' governments in Scotland, Northern Ireland and Wales answer to elected parliaments or assemblies for their area which legislate on different ranges of domestic affairs, including the environment. These devolved administrations are not strictly countries or regions, nor can the UK system be classified as federal, but significant differences are beginning to emerge in the legislation they enact on similar topics, not least those which are the subject of this present study. It would be too complicated to describe all the variations and so, for convenience, most of the governmental material relates to the position in England. It should not be assumed that the position in Scotland, Northern Ireland and Wales is the same. "England" is not shorthand for the UK in this study. However NGO's and databases are often organised at UK level, though with country, regional or even local groupings.

2.4.1.2 Capabilities for assessments and planning

The first group of questions was designed to discover (a) the governance level at which EU requirements for EIA and SEA were transposed into national law as required by the Directives and at which land use planning laws were made and the CAP administered; (b) the governance level for case by case approvals under these systems and whether in relevant cases national laws extended the application of EIA and SEA beyond strict EU requirements; and (c) mitigation and monitoring requirements flowing from environmental decisions.

Governance levels for law making

Noting the absence of a formal SEA system in Turkey, it was otherwise not surprising to find that all the countries **make laws** for EIA and SEA at national level (Figure 2.1), except for the UK where they are made at sub-national level, e.g. England.

The same arrangements apply to the administration of the CAP, or in the case of Turkey, alignment with the CAP. In other words national or sub-national ministries with responsibility for agriculture administer agricultural policies and funds.

All the countries have a land use planning system, though this is not formally the subject of EU legislation. In all cases laws are made at national level, except for the UK where the level is sub-national. Additionally in Hungary some planning regulations are made by local municipalities.

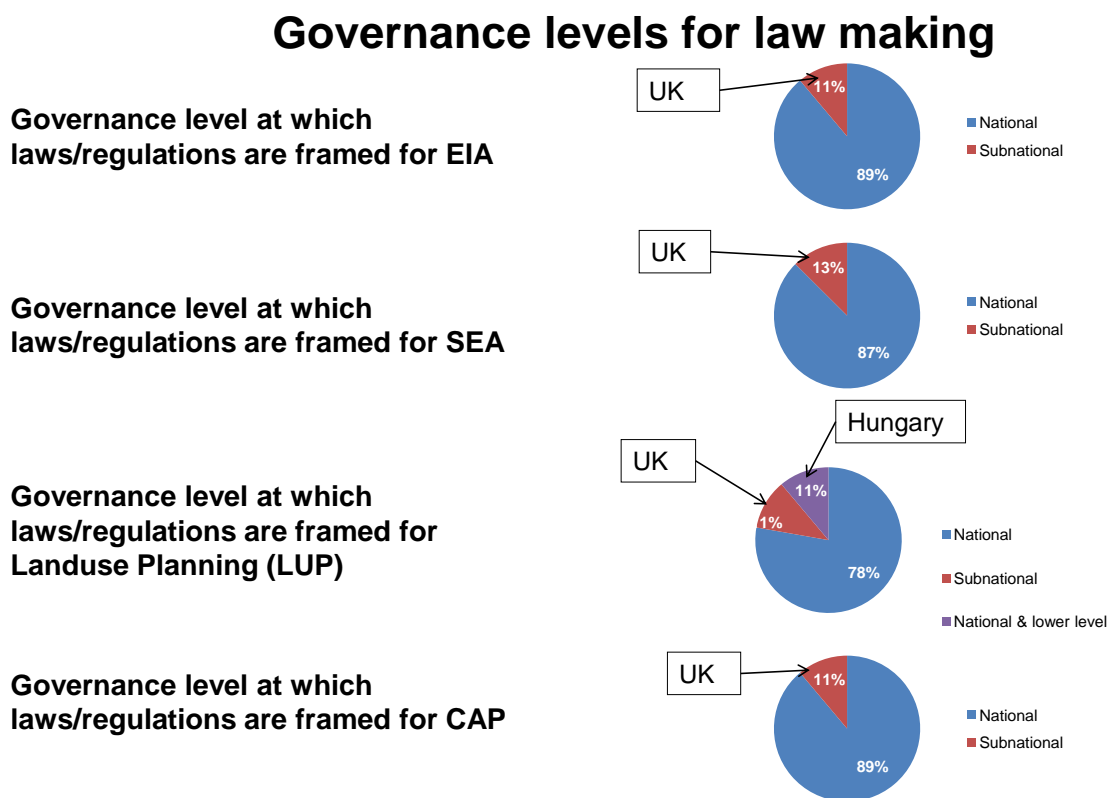


Figure 2.1. Governance levels at which laws/regulations are framed for environmental regulations, land-use planning and agricultural policy.

2.4.1.3 Governance levels for case by case approvals

When we turn the systems for **approval** of applications for permission or CAP funds the situation is slightly more complicated, although fairly clear patterns emerge.

In general **project approval in cases where EIA is required** is given at a governance level below national or sub-national. One partial exception to this generalisation is

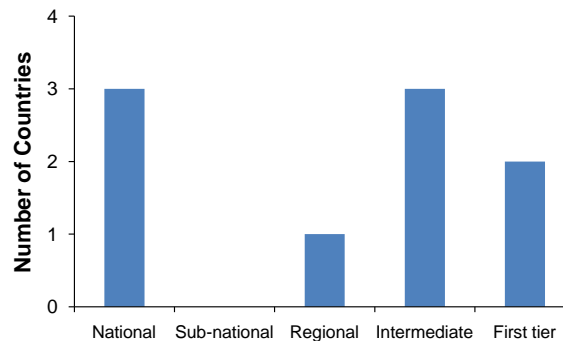
Portugal (Figure 2.2). Although the EIA Directive does not require that environmental assessments given under the Directive should themselves be approved, in Portugal this is the case and the approval is given by national authorities (such as the Secretary of State for the Environment), after which the project itself is usually approved at local government level unless it is a large infrastructure development. In Estonia, approval of the EIA itself is at national level and is given by the Environmental Board.

Turkey also approves some cases at national level. In England (UK) approval in all cases is at district or equivalent council level, which is the level at which land use planning applications are approved, though on appeal cases are decided by or on the recommendation of inspectors appointed by a government department. In future the position in England may be complicated by very recent legislation which takes decisions on major projects such as airports and power stations out of the hands of local authorities and remits them to a nationally-appointed planning commission. In the remainder of the countries studied, approvals for projects where EIA is required are given variously by municipalities (1st tier), districts, counties, prefectures, voivodships or regions, or provincial departments of ministries in the case of Turkey.

Governance levels for approval

Lowest level for:

EIA



SEA

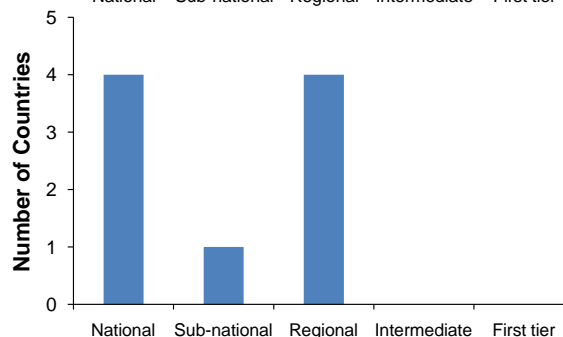


Figure 2.2. Lowest level for approvals of EIA's and Sea's in the eight (9 case studies) countries for which returns were received.

Plans or programmes requiring SEA are mostly approved at higher levels than is the case with EIA. An obvious reason for this is that the plans or programmes concerned often cover the areas of several authorities or deal with issues in which the authorities lack specific expertise. In this study only Portugal and Estonia approve SEA's or SEA

cases exclusively at national level, but all the other countries do so through through sub-national or regional authorities or voivodships in the case of Poland.

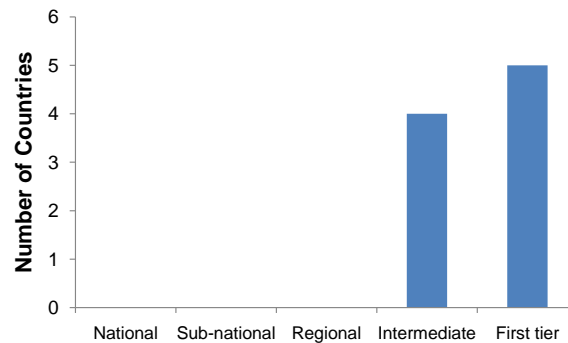
Approval of land use planning applications is generally at local authority level, such as the district or equivalent authority in England or municipalities elsewhere (Figure 2.3). Minor exceptions to this rule are that in Romania counties give approval, in Hungary regions or counties deal with certain cases and in Greece prefectures take the decisions, while in Turkey either ministries or provincial departments retain responsibility.

CAP project approval and support is almost universally a function retained by central government, whether national or sub-national, but an exception is Romania where counties have responsibility, while in England the agency responsible for both nature conservation and the countryside, Natural England, deals with applications from and payments to farmers. In Turkey decisions on agricultural support are taken at national government level.

Governance levels for approval

Lowest level for:

Landuse Planning



CAP

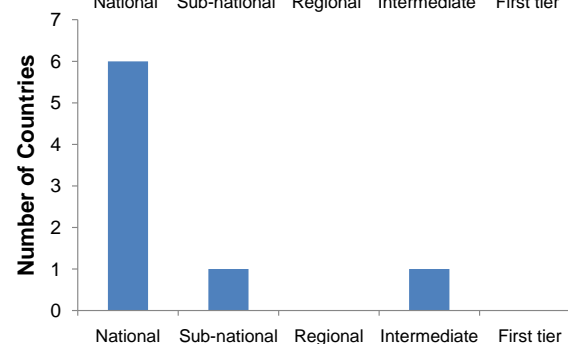


Figure 2.3. Lowest level for approvals of land-use planning and CAP applications in the countries for which returns were received

2.4.1.4 Extension of EIA & SEA Directives by national laws

As regards **extension of the application of EIA** to more cases than the Directive requires there is a roughly even split between the countries. In Poland, Hungary, Estonia, Slovenia and Greece application is extended, while in Portugal, Romania, Turkey and England it is not.

Partners were asked whether **SEA is applied to 'plans and programmes'** in their countries, as required by the Directive and to give examples of these. In all countries except Turkey, where SEA is not in force, the response was positive. The examples given covered the expected regional land use and urban spatial strategies or frameworks, as well as a good range of sectoral plans such as those for transport, energy, water management, hazardous waste disposal, rural development and National Parks and protected areas (Figure 2.4).

Plans and programmes that SEA applied to

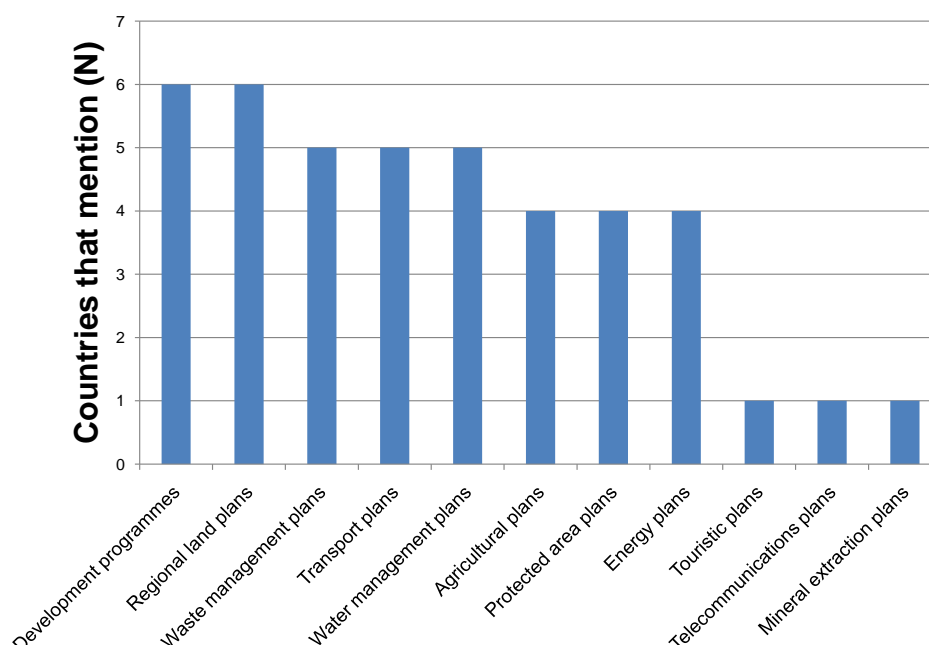


Figure 2.4. Examples of the types of plans and programmes that SEA was applied to in the seven countries where it is in force.

However some countries go further than strictly obliged in their application of the SEA Directive and require appropriate assessments to be applied to 'policies and/or strategies', though it needs to be acknowledged that the distinction between 'plans' and 'strategies' is a fine one. When partners were asked **if their countries had extended SEA** beyond plans and programmes, only Poland and Hungary had done so. In Poland SEA has been applied to energy policy to 2030 and to the National Development Strategy 2007-2015. Hungary has subjected its National Climate Change Strategy and the National Strategy for Sustainable Development to SEA.

2.4.1.5 An overview of numbers of EIA's and SEA's annually

The enquiry asked whether countries kept **records of the number of EIA's completed annually** and, if so, the actual or estimated numbers and any categories into which they

might be broken down. It should be noted that although the Directive does not require central records to be kept the Commission urged Member States to do so in their 2003 progress report on the Directive. **The same questions were asked in relation to SEA's.** A further question was whether a sample of EIA's and SEA's could be obtained if needed to examine how biodiversity information had been used in the particular cases. Table 2.3 compares the results on a country by country basis.

Table 2.3. Numbers of EIA & SEA cases annually where recorded with an indication of whether or not information is available on the categories of EIA or SEA considered. Information is coded as: Y=yes, N=no, U=uncertain, N/A=not applicable and N/R=not recorded.

	EIA		SEA		Samples
	Number	Cat.	Number	Cat.	
UK	313	Y	N/R (500-600 est.)	N/A	U
Turkey	110	Y	N/A	N/A	Y
Romania	822	N	105	N	Y
Portugal	100	Y	10	Y	Y
Poland	N/R	N/A	N/R	N/A	Y
Hungary	N/R	N/A	N/R	N/A	Y
Estonia	N/R	N/A	N/R	N/A	U
Greece	1600*	N	N/R	N/A	U
Slovenia	250	N	50	N	Y

* Estimate from EC 2003.

2.4.1.6 National compliance, sustainability and ecological infrastructure

The issue of whether partner countries had been **found to be non-compliant** with any aspects of the EIA and SEA Directives was addressed. Only Romania was reported to be currently in breach – in relation to interactions with Article 6(3) and (4) of the Habitats Directive. In the case of the UK and Greece previous criticisms by the Commission were mentioned: in the case of the UK this related to inadequate transposition of EIA requirements relating to the conversion of land for intensive agriculture and in the case of Greece the omission of some project types from national law, including those relating to such conversion.

Respondents were asked if any **laws on EIA, SEA or LUP require sustainable development or social and economic issues to be taken into account** in assessments. This was broadly the position in all countries. Comments from Romania indicated that economic and social considerations could figure in SEA environmental reports and this was also the case for Portugal, though formal sustainability reports were not required. In Hungary only certain socio-economic aspects could be considered while in Greece LUP law strongly incorporates the concept of sustainable development.

A related issue was whether **these laws require ecological infrastructure such as connectivity between designated areas** to be taken into account. In most countries this is required but England and Greece are exceptions. The comment was made that in Romania projects which directly or indirectly affect protected areas must be screened with ecological considerations in mind. However this could be regarded as a requirement of the Directive, so should not be regarded as unique to this country. In England biodiversity issues must be considered but not ecological networks or infrastructure as such.

2.4.1.7 Operation of EIA Directive: Monitoring and Mitigation

Monitoring of environmental impacts of approved projects is carried out always in Turkey, Romania and Hungary and sometimes in the remaining countries (Figure 2.5). In England, Portugal, Poland, Romania, Hungary, Slovenia and Estonia the developer is responsible and must report to the relevant authority such as the Environment Protection Agency in Romania, the National Biodiversity Conservation Authority in Portugal or the National Inspectorate for Environment, Nature and Water in Hungary. In other countries monitoring is by authorities, e.g. General Directorate of Environmental Impact Assessment in Turkey, and regional authorities in Greece.

Who is responsible for EIA monitoring?

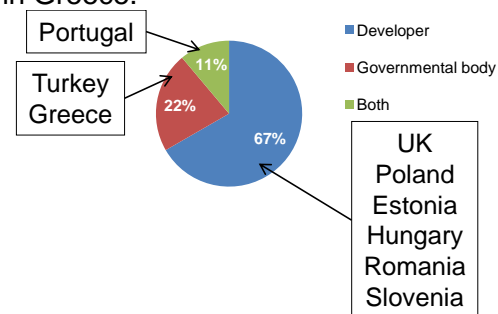


Figure 2.5. Responses to who is responsible for undertaking monitoring of the environmental effects of approved projects.

When the study examines whether **mitigation in the form of restoration or habitat creation is required or encouraged** in cases where significant damage to the environment occurs (through non-observance of EIA, SEA etc conditions or procedures) the findings are that in Poland, Slovenia and Hungary mitigation is mandatory; in Portugal it is mandatory in some cases; and elsewhere it is encouraged.

2.4.1.8 EIA and Agricultural Intensification

The EU EIA Directive requires assessment to be carried out on a case by case basis or above certain thresholds when **uncultivated land or semi-natural areas are proposed**

to be converted into intensive agricultural use. After the original Directive was adopted in 1985 a number of Member States were slow to apply this provision, so partners were asked to discover whether it is now being applied in their countries and, if so, in relation to what thresholds or conditions. (N.B. Removal of field boundaries such as hedges for the purpose of agricultural reconstruction is also covered but partners were not asked expressly to look into this.)

All countries in the study except Greece do require EIA in these 'intensive agriculture' cases. However the thresholds for application have generally been set very high as shown in Table 2.4 below:

Table 2.4. Thresholds for application of EIA to projects involving agricultural intensification.

	Area for EIA to be applied	Period of previous non-cultivation
England	100ha - less in designated areas	15 years
Turkey	500ha	-
Romania	No threshold	-
Portugal	100ha or 50ha in sensitive areas	5 years
Poland	300ha (re-parcelling)	-
Hungary	50ha but 1ha in designated areas; 30ha for deforestation	-
Estonia	100ha; also for forestation	-
Slovenia	no threshold	-

For England it was also reported that up to 4 km of field boundaries could be removed for restructuring of a holding before EIA is required. In Hungary the threshold for removal of boundaries for restructuring is 300 ha in normal situations but 10 ha in designated areas. The 300 ha mentioned for Poland in Table B presumably also relates to restructuring.

In most countries where the rule applies re-instatement is required if the rules are infringed. Similarly CAP cross-compliance payments would probably be lost in England, Slovenia and Hungary but not in Portugal, Estonia and Poland. The questions on sanctions for infringement were not answered in the return from Romania because the relevant information could not be obtained. It should be noted that the rules on applying EIA to agricultural intensification cases are complicated in themselves, added to which member states have considerable flexibility in applying them. It seems likely that the

questions on thresholds and sanctions were over-simplified and that the results should be treated with caution, though it is clear that a number of states set high thresholds.

These provisions of the EIA Directive on the conversion of uncultivated or semi-natural land into intensive agriculture and the related ones on the removal of field boundaries such as hedges are potentially valuable for biodiversity because such agricultural practices in Western Europe during the heyday of the CAP have been seriously damaging to wildlife, especially outside protected areas. It is unfortunate that, on the basis of anecdotal evidence (e.g. the Commission's 2003 report on the operation of the EIA Directive), they appear to have been very little used. There is more than one explanation for this. On the one hand there has, since 1985, been less of a general trend towards intensification under the CAP and even, in more recent years, the gradual application of more environmentally friendly policies. A less satisfactory reason is that, except in Hungary, Estonia, Slovenia and Romania among the countries studied, the thresholds have been set so high that few if any cases are caught by them. Moreover it is possible that farmers considering conversions which could potentially be affected have been advised to break up their projects into smaller ones to avoid triggering off EIA procedures.

2.4.1.9 EIA's and NGO involvement

Partners were asked **if certain environmental or biodiversity NGO's in their countries frequently comment on proposals where EIA is required** and, if so, to provide names of some of the leading bodies, indicating if they were national, regional or local. Responses could only be impressionistic since in few, if any countries, are projects subject to EIA and all their attendant documents kept on a common database nor was it practicable within the parameters of this preliminary enquiry to approach individual NGO's directly. However partners in Greece and Turkey both commented that NGO's in their countries are only infrequently involved in EIA cases, but the opposite would be true for England. In Portugal NGO's do become involved in EIA's applying to large and potentially damaging developments such as airports and power stations. Table 2.5 provides an overall picture.

Table 2.5. Number of NGO's commenting on EIA's and at what level (*i.e.* national, regional or local – the same NGO can comment at more than one level).

	UK	Turkey	Romania	Portugal	Poland	Hungary	Estonia	Greece	Slovenia	Total
All NGO's	5	4	7	5	6	6	4	1	1	39
National	3	4	1	3	6	5	4	1	1	28
Regional	3	-	4	2	3	1	-	-	-	13
Local	3	-	2	-	-	-	-	-	-	5

It should be stressed that these samples of NGO's are not necessarily representative and that information about involvement by local NGO's will be harder for an individual research team to know about without conducting a formal survey. Nevertheless the

preponderance of involvement by national level NGO's is striking and doubtless reflects the resources and technical expertise considered necessary to become involved in EIA procedures. Examination of the names of the NGO's listed by partners (see Table 2.6 below) reveals quite a wide spread of interests.

Table 2.6. Similar types of NGO's that comment on EIA applications across the countries surveyed.

	National bird groups	WWF Associates	Friends of the Earth
UK/England	Royal Society for the Protection of Birds		Friends of the Earth
Turkey	Nature Society (Birdlife affiliate for Turkey)	WWF-Turkey	
Romania	Societatea Ornitologica Romana (Romanian Ornithological Society) (Partner of Birdlife International)	Salvati Dunarea si Delta (Save the Danube and Delta)	
Portugal		Liga para a Protecção da Natureza	
Poland	Polish Society for the Protection of Birds (OTOP) (Part of Birdlife International)		
Hungary	Birdlife Hungary (Hungarian Ornithological and Nature Society)	WWF Hungary	National Society of Conservationists Friends of the Earth
Estonia		Estonian Fund of Nature (ELF)	Estonian Green Movement Fo-E (ERL)
Greece		WWF Greece	
Slovenia	Birdlife Slovenia		

2.4.1.10 Interaction of EIA with LUP system

The question was asked as to whether the **'development consent' required by the EIA Directive is always, partly or never administered as part of the LUP**. For all countries the answer was 'partly'. Comments revealed that in all countries there are special arrangements for sectors such as agriculture, energy, harbours and forestry which are not fully covered by the LUP system. However information from elsewhere

(EC 2003) indicates that the great majority of EIA cases are dealt with under the LUP system.

In view of the very wide variations between the number of EIA cases annually in different EU Member States partners were asked **whether EIA is required in all cases where development proposals are made**. If the response to this question was 'no' the consequent questions were whether in the other cases the LUP system or planning policy supports biodiversity conservation positively or requires negative effects on biodiversity to be taken into account. In cases where EIA is not required most countries include a requirement to support biodiversity conservation and to avoid negative effects in their LUP policies, though Hungary, Poland and Greece qualify this by responding "sometimes" (Figure 2.6).

In developments where EIA is not required, does the LUP system/planning policy support biodiversity or nature conservation in a positive way?

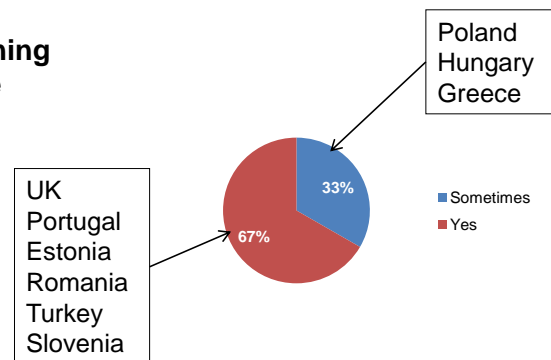


Figure 2.6. Where EIA is not required, does the land-use planning system support biodiversity?

2.4.1.11 Formal and informal guidance on the working of EIA, SEA and LUP

The enquiry sought information as to whether national or sub-national authorities had **issued formal guidance** to authorities who have the decision-making role in relation to EIA, SEA or the LUP system. For 7 countries the answer was 'yes', but in Estonia the guidance issued by the EC is relied upon, while in Slovenia workshops were organised. Respondents were asked to give the title of one such document, from which it was clear that most guidance documents were general in character. Hungary mentioned guidance on cross-compliance under the CAP. It was also asked if the authorities had issued **practical guidance** for developers and others who decided to become involved in EIA and similar processes. In 7 countries this was so, with Turkey and Slovenia as exceptions. Titles of practical guidance documents were supplied in the cases concerned.

Respondents were also asked if experts or NGO's had issued **practical guidance** on EIA, SEA or LUP procedures and for titles. In 7 countries such guidance documents had been issued, but not in Estonia or Slovenia. Examples given ranged from full scale books by such experts as Therivel and Partidario to NGO publications and guidance on consultants' websites.

2.4.1.12 Availability of biodiversity information for decision making

In 7 countries the guidance listed sources of environmental information, the exception being Greece. In 6 out of the 7 cases where sources are listed this includes biodiversity information, Hungary being the exception. A series of detailed questions was then asked about the accessibility and nature of the biodiversity information. With hindsight it was realised that responses on these details would have been useful even if the sources were not listed in guidance on EIA's etc. Efforts were made to overcome this problem after questionnaires had been returned. For the 8 countries able to respond to detailed queries on biodiversity information the picture is given in Table 2.7 below.

Table 2.7. The availability & nature of biodiversity information in the eight countries that responded to queries on biodiversity information.

	Yes	No
Accessible to all	7	1
Accessible via the internet	8	0
Fragmented	7	1
Payment needed	5	2
List of protected areas	8	0
List of protected species	8	0
Species population/habitat extent	6	2
Baseline plus trend data	4	4

Portugal commented that generally biodiversity information is very limited and sometimes of poor quality. Greece observed that "conservation of biodiversity is constantly mentioned but without species or habitat references." In England where the volume of biological records is very large, much still in paper form only, baseline and trend information is not easily available except in the case of birds, where the British Trust for Ornithology has maintained a number of national surveys over several decades. In so far as comments were made on the question of fees they were to the effect that simple information is generally available without charge but more complicated requests attract fees.

2.4.1.13 Biodiversity websites

Partners were asked to name up to 4 websites where important biodiversity information for EIA/SEA/LUP could be found and to indicate if the websites were national, regional or specialised such as taxon specific or run by NGO's or private bodies. Table 2.8 shows

the number and type of website by country, noting that individual websites could be of more than one type. The lists were not meant to be exhaustive, so that if the number listed is less than 4 it does not follow that no more websites could have been listed.

Table 2.8. The number and type of biodiversity information websites in the eight countries responding.

	National	Regional	Specialist	Total
UK	3	3	1	3
Turkey	5	-	-	5
Romania	4	1	-	5
Portugal	1	-	1	2
Poland	2	1	1	4
Hungary	3	-	1	4
Estonia	1	-	-	1
Greece	2	-	2*	4
Slovenia	3	-	1	4
Total	24	5	6	32

* one of these was run by an NGO and the other by a private entity.

Finally in this section partners were asked if they were aware of any **research in their country on EIA/SEA/LUP relevant to the use of biodiversity information** and, if so, to provide a reference. A positive answer was given in respect of 4 countries (Turkey, Romania, Portugal and Greece) but the titles cited did not refer specifically to biodiversity and may be general overviews, suggesting that the question was not clearly expressed. The Commission's 2003 EIA progress report (EC 2003) devotes less than 2 pages out of 100 to impacts on biodiversity and it has not proved possible to find the one research report on biodiversity mentioned there.

2.4.1.14 Biodiversity Action Plans (BAP's)

Partners were asked to provide information about the **availability of Biodiversity Action Plans at national and lower levels, who prepares them and whether they apply to species, habitats or both**. All countries have Plans in operation or, in the case of Greece, in preparation. All Plans cover both species and habitats except those for Portugal and Slovenia which cover species only (Figure 2.7).

Among partner countries, only the UK has what might be termed a super-abundance of BAP's. There is an overall UK Plan, plans for England, Scotland, Wales and Northern Ireland and some 160 plans for areas related to lower governance levels, often for counties in England or boroughs in urban areas. Under the UK and individual 'country' Plans there are several hundred species plans and rather fewer habitat plans. Within the lower level area plans there are typically a considerable number of action plans for individual species and habitats which help to support the 'country' and UK Plans. Most of these have targets and therefore rely on data collection for monitoring progress towards the targets. No country, apart from the UK, has BAP's at levels below the national. After the UK comes Hungary with 43 plans, all at national level. Portugal has more than 10.

Biodiversity Action Plans

Are there Biodiversity Action Plans with biodiversity information available at national or sub-national level?

Are there Biodiversity Action Plans with biodiversity information available at lower governance level?

160 - UK, only number given

Are Biodiversity Action Plans prepared for species and habitats?

Who prepares the Biodiversity Action Plans?

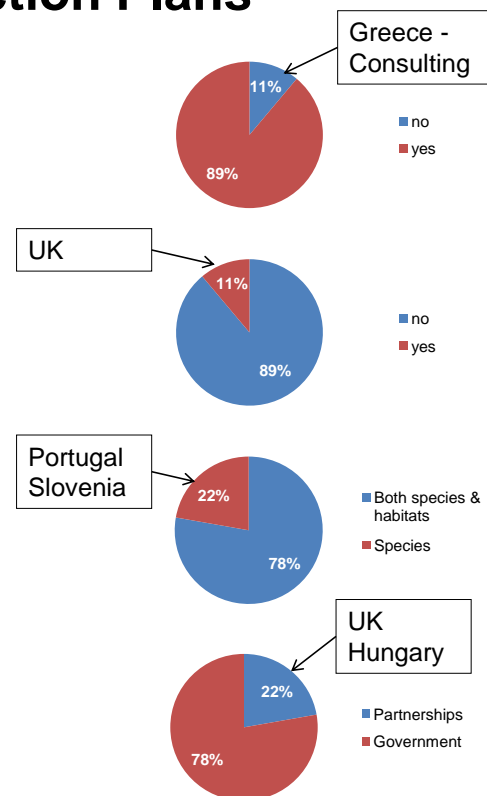


Figure 2.7. Information provided on the availability of Biodiversity Action Plans, whether they apply to species, habitats or both and who prepares them.

Governments prepare BAP's in 7 of the 9 countries (Figure 2.7), the exceptions being Hungary and the UK where they are prepared by partnerships. The latter involves NGO's and the academic sector in Hungary. These sectors plus local government and relevant commercial interests are involved in the UK. In Greece, where a draft National Strategy for Biodiversity has only recently been issued for public consultation, the Government takes the lead in preparing the plan but with some assistance from the academic world.

2.4.1.15 Common Agricultural Policy (CAP) and environmental information

Turning to the CAP, respondents were asked whether to receive **basic payments under the CAP** farmers are required to provide **prior environmental information from an independent source**. In Estonia such information is required to establish cross-compliance but in all 8 other countries there is no call for prior independent information (Figure 2.8). However in 8 of the countries there is subsequent independent checking by designated agencies, Turkey being the exception. In 3 cases the agencies appeared to have an environmental remit but in the other 5 the checking organisation was the agricultural payments agency. In England detailed environmental information (as opposed to ticking boxes) is not needed for the first level agri-environment scheme, called “Entry Level Stewardship” but it is required for the second “Higher Level Stewardship”.

CAP & Agricultural Policy

Do basic payments to farmers under the Common Agricultural Policy subsidy rules require prior input of environmental information from an independent source?

Is there subsequent checking of compliance with environmental rules?

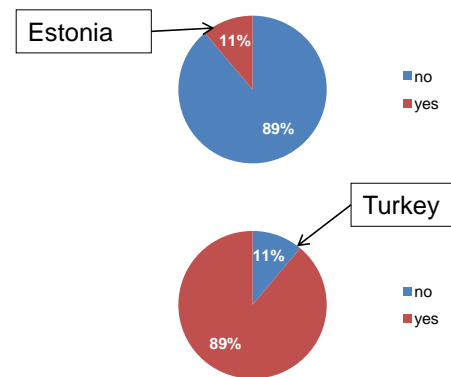


Figure 2.8. Agricultural policy and the environment.

Partners were asked about the existence of **payments to farmers for planning agri-environment schemes**. Initial responses for 3 countries were positive (England, Turkey and Romania) with the remainder being negative, but the responses for England and Romania were later modified to join the “no” responses. With hindsight it is clear that this question was not carefully worded nor well-related to a subsequent more detailed question about the existence and scope of agri-environment schemes in partners’ countries. In fact all countries studied, except Greece, have agri-environment schemes. There is no scope for CAP funding for the **planning** of these schemes and it seems unlikely, though not impossible, that countries fund individual farmers’ agri-environment planning activities out of their own funds without joint-financing from the EU. What does occur is the use of EU structural funds for workshops and general training on such matters. The position in England is that the taxpayer does not fund the planning and application process for such schemes. It is interesting to note that an environmental charity, Farming and Wildlife Advisory Group (FWAG), charges £400 (€452) per day for advising farmers on the schemes available and helping them to prepare applications related to conditions on their farms (see www.fwag.org.uk).

Respondents were asked if in their countries there was still **support via government or EU funding for the planting of specific crops or to improve productivity** generally. England, Estonia and Greece said there was not, with the other 6 countries saying there was. The position as expressed on the DG Agriculture website is that the 2003 reforms, implemented from 2005, have in principle, with minor exceptions for remote areas and the Aegean Islands, ended the system of direct payments for individual crops but in certain circumstances existing payments of this kind can be continued until 2012 subject to cross-compliance and to “degressivity” (reducing subsidies by increasing percentages annually). In practice a greater proportion of the CAP funds is still going into production subsidies (Pillar 1 – products and markets) than into single farm payments under cross-compliance or agri-environment schemes (Pillar 2 – rural development). In addition Portugal commented that in a number of Mediterranean countries expenditure on infrastructure such as dams to help increase agricultural production is being funded from other EU sources such as the cohesion and structure funds.

It was then asked if countries had **payments above the basic level for agri-environment schemes** and, if so, whether these were restricted to (i) Natura 2000 sites, (ii) Natura 2000 and other special habitats or (iii) everywhere provided special conditions are met. All countries except Turkey and Greece reported having such payments. In England, Poland and Hungary they were reported as being available everywhere, in Portugal, Slovenia, Estonia and Romania (from 2010) as available in Natura 2000 and other special sites. (Figure 2.9). In Portugal payments are conditional on farmers complying with obligations designed at the national level or at the level of special landscape units, usually Natura 2000 sites, and there are no agri-environment schemes tailored to the level of individual farms.

Agri-environment schemes – where available?

Do countries have payments beyond the basic level for agri-environmental schemes?

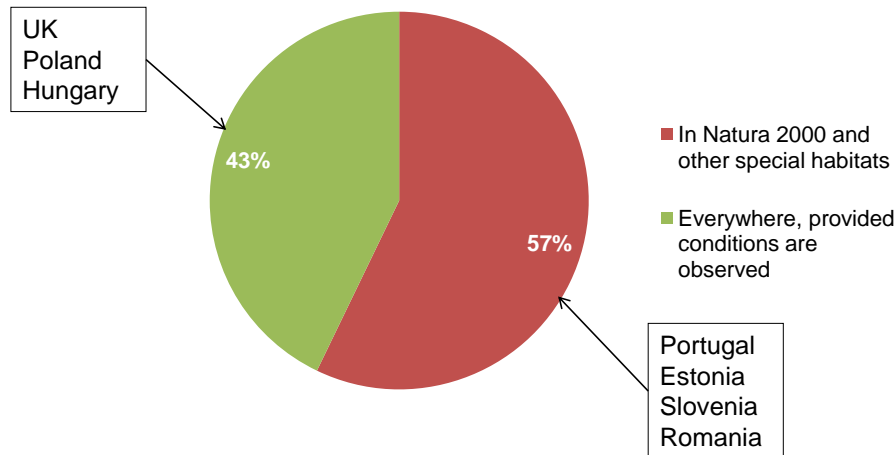


Figure 2.9. What countries have agri-environment schemes beyond the basic level?

Finally the question was whether farmers were required to **provide maps** to claim CAP payments and whether these could be submitted electronically. The response was that maps are required in 7 countries but not in Greece or Turkey, while they cannot be submitted electronically in Romania or Poland.

2.5 Some preliminary conclusions

Following are some conclusions relevant to the TESS project as it develops based mostly on the information from the National Level Enquiry in 8 countries, but to some extent on information in the Commission's reviews of EIA and SEA and other literature. Whether the comprehensive survey of all 27 EU member states and 4 other countries in Europe will support these conclusions remains to be seen.

- EU EIA & SEA Directives and national LUP laws are generally sound in theory
- They require input of biodiversity information where relevant
- They encourage public involvement and transparency
- But formal processes are often daunting, resulting in dominance by "experts"
- The wide variation in numbers of EIA's annually by country has not been explained – it must affect the quality of assessment & monitoring
- There is no obligation on governments or anyone else to ensure the availability or quality of environmental data need for EIA,SEA or LUP, , although the INSPIRE Directive (2007 EC) is a major effort to fill this gap at European Union level.
- Where EIA's and SEA's have assembled data, including biodiversity data, there is no obligation on member states to store and make this available for wider environmental monitoring by organisations such as the European Environment Agency or nationally
- There is plenty of biodiversity data on the internet but the geographical coverage and quality are generally poor for decision making
- Main contents are lists of endangered species and habitats
- There is an absence of policy responsibility for making it fit for use
- BAP's are useful tools where they exist but the absence of regional or local Plan's in most countries limits their relevance for decision support
- CAP is only at the beginning of using environmental and biodiversity information at farm level
- We need a better idea by country of the extent of land still farmed under production subsidies compared with land under single farm payments and more specialised agri-environment schemes
- Generally there is a lack of integration between biodiversity information providers and the decision making regimes we have been studying.

3 WORK PACKAGE 3 - LOCAL ENVIRONMENTAL INFORMATION

3.1 Introduction and Aims

TESS Work Package 3 (WP3) was designed to gather information at the local level, in rural areas, to complement the information collected concerning the national level in TESS WP2. This local enquiry gathered data from 9 case study areas, in 8 countries, to characterise the use of information on biodiversity and ecosystem services in the environmental decision making process. Conducting the survey across the TESS partner countries allowed the consortium to research local requirements across a range of governance systems and bioregions in EU and accession states.

At the local level, the decisions include formal processes like SEA and EIA, as in WP2, but also local planning applications, and the myriad informal decisions made by communities and individuals that are small-scale individually, but summate to change the environment.

The enquiry at local level therefore considered (i) local administrations involved in formal assessment and planning decisions, including participatory processes, and informal decisions for managing public land or guiding community actions; and (ii) informal decisions by local stakeholders.

The enquiry addresses the following questions relating to the flow of information on biodiversity and ecosystem services at the local level:

- What are the information needs?
- What determines the information needs?
- What information is used?
- What information is needed but currently unobtainable?
- What are the barriers to obtaining information?

Analysis of the survey data will address these questions across the sample of countries. It will also provide preliminary insights into the potential for analysis of the relationships between the utilization of such information, and key differences between the case study areas. Such differences might include their environmental governance, the nature and extent of community participation, land-use, and status in terms of biodiversity conservation. These insights, and accompanying critique of the survey methods, will be used to plan and develop the following work packages of this project (see Section 1).

3.2 Background

Paradoxically we are not limited by lack of knowledge but failure to synthesis and distribute what we know²

3.2.1 Environmental data availability

In order to make choices that are appropriate and informed, decision makers at all levels need ready access to environmental data that is relevant, up to date, appropriately scaled and in a format that is fit for purpose. Unfortunately, despite the huge growth in capacity for data gathering, storage, and dissemination in recent decades, the authors of

² Pimm *et al* (2001) Can we defy nature's end. Science 293: 2207-2208

the Millennium Ecosystem Assessment (MA) (2005) concluded that “Effective management of ecosystems is constrained both by the lack of knowledge and information about different aspects of ecosystems and by the **failure to use adequately the information that does exist in support of management decisions.**”

The MA identified specific gaps in information availability that hindered decision making for managing the environment. These included:

- Major gaps in global and national monitoring systems resulting in the absence of well-documented, comparable, time-series information for many ecosystem features and that pose significant barriers in assessing condition and trends in ecosystem services. Moreover, in a number of cases, including hydrological systems, the condition of the monitoring systems that do exist is declining.
- Poor availability of *processed* remotely sensed data on land-cover, despite 3 decades of data production.
- Major gaps in information on non-marketed ecosystem services, particularly regulating, cultural, and supporting services.
- Limited information on the distributions of many important species.

They concluded that more information is needed concerning:

- the nature of interactions among drivers in particular regions and across scales;
- the responses of ecosystems to changes in the availability of important nutrients and carbon dioxide;
- nonlinear changes in ecosystems, predictability of thresholds, and structural and dynamic characteristics of systems that lead to threshold and irreversible changes; and,
- quantification and prediction of the relationships between biodiversity changes and changes in ecosystem services for particular places and times.

Major initiatives have now been set up that address some of these issues and examples of these can be found in many areas of the world. For instance, many areas now have regional or national data repositories e.g. the [National Biological Network](#) (UK), the North American Biodiversity Information Network (NABIN), and the [Canadian Geospatial Data Infrastructure](#).

As environmental data from many different organisations is compiled across boundaries, for increasingly large geographic areas, the need to ensure compatibility becomes increasingly challenging and this is currently the focus of much international effort (Table 3.1). For example, the [Global Biodiversity Information Facility](#) (GBIF) aims to register all specimens in botanical, paleontological and zoological collections around the world, and make this information freely available on the Internet. One of GBIF's main purposes is enabling a global distributed network of interoperable databases that contain primary biodiversity data (data associated with specimens in biological collections, as well as documented observations of plants and animals in nature). The Dutch national node of the GBIF is the Netherlands Biodiversity Information Facility ([NLBIF](#)) that provides species distribution maps which are utilised for site specific planning (H. de Jongh, personal communication, September 22, 2009).

Table 3.1. Examples of systems for enabling access to environmental data and analysis tools and incorporating local communities in environmental modelling and decision-making.

Project	Details
INSPIRE Directive Infrastructure for SPatial Information in Europe http://inspire.jrc.ec.europa.eu/ 2007-2012	Designed to support EU environmental policies, and policies or activities which may have an impact on the environment. It will provide access to spatial or geographical information from 34 spatial data themes from a wide range of sources, from the local level to the global level, in an inter-operable way for a variety of uses. The target users of INSPIRE include policy-makers, planners and managers at European, national and local level and the citizens and their organisations. Possible services are the visualisation of information layers, overlay of information from different sources, spatial and temporal analysis, etc.
InVEST – Integrated Valuation of Ecosystem Services and Tradeoffs http://www.naturalcapitalproject.org/ConEX.html	A natural capital modelling and mapping tool produced by the Natural Capital Project, Stanford University, California. Software tool, in beta release, to support environmental decision making by helping users visualize the impacts of potential decisions, identifying tradeoffs and compatibilities between environmental, economic, and social benefits.
The InterAmerican Biodiversity Information Network (IABIN) http://www.conservationcommons.org/media/document/document-a3gvvi.pdf	IABIN is both an Internet-based information resource with common infrastructure and content, interoperable through the use of common standards, and a forum for institutions and individuals to discuss the issues related to sharing and exchange of biodiversity information. Its mission is to promote compatible means of collection, communication, and exchange of information relevant to decision-making and education on biodiversity conservation.
Linking Ecological Monitoring to Decision-Making at Community and Landscape Scales EMAN http://www.eman-research.ca/eman/reports/publications/2005/camesa/CAMESA.pdf	EMAN is exploring appropriate mechanisms to link community monitoring to decision making in landscapes and watersheds. This changes the dynamics in identifying the relevant decision making regime, in characterizing and delivering needed information, in defining sustainability and in choosing between policy options and trade-offs. Such a scale is required to manage and improve wildlife habitat and biodiversity, water resources, and sustainability in complex cultural landscapes.

3.2.2 Environmental information for rural land management

In addition to the challenges of data compatibility between organisations, and across national boundaries (see section 3.2.1), many further factors need to be addressed in order to provide an effective flow of environmental information that is suitable for enhancing decision-making for land management. Theobald *et al* (2005) identified four 'fundamental challenges' to providing effective ecological support to rural land-use planning. Each of these issues resonate strongly with the aims and challenges of the TESS project.

1. *Mismatch of scales* - a mismatch between the spatial and temporal scales of ecologist's understanding of systems and those where land-use decisions occur may render information less useful. Scale issues have long been recognised as a key concern in ecological science (e.g. Gontier 2007; João 2007; Wheatley & Johnson 2009). Information may be recorded at scales determined by limitations of the original survey design or technologies.
2. *Lack of evaluation* – there is a need to address a lack of systematic or critical evaluations of the efficacy of ecological information on land-use decision outcomes. There is a need to determine “**how ecological information is used, how it can be improved, and what different information is needed.**” In reference to the [Natural Diversity Information Source](#) website, Theobald *et al* (2005) ask: “How many land-use decisions have been influenced by it? How many times have the maps been considered during land-use hearings? How many county supervisors, planning and zoning commissioners, or interested citizens have visited the website?” The surveys undertaken in TESS work packages 3 and 5 help address these questions (see sections 3.1 and 3.3.1).
3. *Poor classification systems* – there is a need for improvements to the organisation of land-use classification systems and the cataloguing of management or activities. Broad or inappropriate classes of either of these impede efficacious use of information in decision-making. When working across national boundaries, all of these classifications become increasingly challenging. Theobald *et al* (2005) note that cultural and linguistic differences in the understanding of both land use classes and management activities need careful assessment and clear definition.
4. *Adaptive management* – better use of ecological information would enable adaptive management (Holling 1978) in rural land use decision-making. In other words, ecological information needs to be updated through effective monitoring schemes in order to evaluate and adapt management regimes. Here, engagement of local communities and individuals may often be key to the successful implementation of the long-term commitment required for adaptive management.

An additional challenge is the incorporation of predictive ecological models into the data repositories in order to transform raw information into more sophisticated tools. This challenge is core to the TESS project and other concurrent research e.g. the InVEST tool for modelling natural capital (Table 3.1).

3.2.3 Participation of local communities in environmental decision-making

Enabling more effective information exchange between local communities and the tiers of government that influence them should allow a move away from the “tyranny of small decisions” where policy is ineffective (Odum 1982) and local communities are disenfranchised. The importance of local management consultation in rural areas is increasingly recognised. For instance, (Morgan-Davies et al. 2005) used a consultation process with farmers, land managers and conservationists to demonstrate a mismatch between agri-environment policy and schemes in Scotland. They acknowledged that some difficulties may be solved through changes under CAP reform but highlighted the need for the use of local knowledge to enable schemes to reflect regional needs and they suggest the adoption of a local area farm plan approach. This could take into account environmental conditions, traditions, livestock management and biodiversity conservation issues and economic opportunities and constraints.

Environmental management (and decision making) is as much about managing human activities as managing land and water; therefore requiring the effective engagement of all stakeholders (including government agencies, NGOs, the business community and the general public) in the process of information gathering and policy making. Luz (2000) describes how landscape ecological planning has been primarily the domain of the natural sciences but a lack of communication between scientists, planners, administrators and local stakeholders can hamper the implementation and acceptance of landscape planning projects.

Participatory methods are advocated on the basis that public awareness and participation play an equal role with expert views of natural scientists and planners. Participation engenders a sense of ownership of information and policymaking resulting in a common understanding of issues and a negotiated learning process. Participation is an educative process for both stakeholders and policy makers and results in the empowering of people by increasing the skills of communities, groups and individuals to make better decisions for themselves. Commentators on the benefits of participation, such as Reed (2008) identify ‘normative’ and ‘pragmatic’ arguments where normative focuses on benefits for democratic society, citizenship and equity and pragmatic arguments focus on the quality and endurance of participatory environmental decisions. However, despite the rhetoric on the benefits claimed for participation, there has been some disillusionment amongst practitioners and stakeholders, relating to the degree (Arnstein 1969) and nature of participation, and research is on-going on best practice to engage relevant stakeholders at the right time and in the right manner. Tippet et al (2007) seek to define a new mode of participatory ecological design through the use of a systems thinking framework to integrate participatory approaches within ecological planning.

In addition to effective engagement of local community members there is also the issue of engaging academic ecologists in within the day-to-day decision-making within the planning process. Ecological science needs to be framed in the social and economic context of the local region and the academics concerned will benefit from active participation resulting in a working knowledge of environmental decisions within the planning process (Broberg 2003).

Box 1 – Background to public participation

Public participation may be defined as “the process by which public concerns, needs and values are incorporated into governmental and corporate decision-making. It is a two way communication and interaction with the overall goal of better decisions that are supported by the public” (Creighton 2005). The term may be distinguished from ‘stakeholder involvement’ which would include those affected by a decision in addition to those who are able to influence its outcomes (Jansky et al 2005). The Sustainable Development Commission provides a useful definition of a ‘Stakeholder’ as “anyone who has an interest or ‘stake’ in the subject or the engagement process under discussion – from interested agencies and organisations, to local communities and individuals. It is often used to distinguish interested parties from the (general) public”¹. For the purposes of this report ‘participation’ will be used as a term to include all ‘stakeholders’ including the public.

In the international context, Principle 10 of the Rio Declaration on Environment and Development (UNCED 1992) states that environmental issues “are best handled with the participation of all concerned citizens” which is further re-enforced by paragraph 26 of the Johannesburg Declaration on Sustainable Development (WSSD 2002) http://www.unmillenniumproject.org/documents/131302_wssd_report_reissued.pdf acknowledging the requirement for “broad based participation in policy formulation, decision-making and implementation at all levels”. Nations are encouraged to facilitate public participation through methods that increase i) transparency, ii) participatory decision-making and iii) accountability. In Europe, these principles are reflected in the ‘three pillars’ of the Aarhus Convention (UNECE 1998): Access to Environmental Information, Public Participation and Access to Justice. This reflects the universal recognition of the great importance of involving the wider public in policy making for environmental protection and sustainable development.

Policy commitments are now being made by national and local governments and a range of agencies in both the public and private sector to expand participation in their decision-making processes. In many countries, part of the political agenda for improving governance at national and local level is the promotion of community capacity building across a range of policy areas including spatial (or land use) planning. Participation is an integral part of both Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) and in many countries, for example in the United Kingdom, participation is a mandatory requirement for all planning decisions.

3.3 Methods for survey and analysis

Researchers in each of the partner countries completed desk studies and a series of structured interviews to characterise the TESS case study areas and to evaluate the supply and demand of environmental information and its use in decision-making for activities that affect biodiversity and related environmental concerns.

3.3.1 Selection of case study areas

The case study areas were all situated in rural areas but were selected to represent a range of governance systems and landscape types (Table 3.2).

For each case study area, the TESS partners identified the two lowest tiers of government and at least six local stakeholders from distinct sectors (e.g. forestry and farming) who would all be involved, in some way, in environmental decision-making. At the same time as seeking to represent a range of conditions, efforts were made to find tiers of government and stakeholder representatives that were as equivalent as possible between countries. The Eurostat Nomenclature of Territorial Units for Statistics³ [NUTS](#) classification system, which defines regional units of a general nature, was used to guide selection of the two tiers of local government. As *local* levels of government were sought, the general rule was to collect data from administrations below the level of NUTS 3. In many countries these NUTS 3 regions correspond with counties. Units below NUTS 3 are now defined as Local Administrative Units (LAU) formerly classified as NUTS (4 and 5).

In most cases the lowest, or most local, tier of government for this study (Tier 1) was generally also defined as a LAU 2 (previously NUTS 5). The tier above (Tier 2) this would generally be listed as LAU 1 (previously NUTS 4).

However, the diverse histories, cultures and governance systems across both member and accession states of the EU inevitably result in an imperfect match between the tiers of government of different partner countries in this project. This complication has been discussed at length in other research commissioned by the EU. For instance, in an FP7 project “Assessing the Impact of Rural Development Policies (RuDI)” many complexities were encountered when attempting to apply the EUROSTAT system in Estonia (Peepson & Mick 2008).

³ [Eurostat](#), and Eurostat (2008) [Statistical regions for the EFTA countries and the candidate countries](#)

Table 3.2. TESS Case Studies. Further details on the characteristics of each area formed part of this study and are presented in the results section.

Country/ Case study	Landscape
Estonia/ Keila Parish, Harju County	The parish is located on the coast of Baltic Sea, coastal landscape with sandy beaches or limestone cliff, woodlands (mostly pine forests), agricultural landscapes with small villages, area with high recreational value.
Greece Lake Kerkini (Kerkini municipality)	Municipality of Kerkini consists of smaller settlements, many of those around Lake Kerkini. It includes the Lake's wetland, coastline, forests, agricultural lands, a river branch with high conservation interest, fishery, forestry, tourism, agriculture, wild life.
Hungary Bózsza	Bózsza is a small village in the middle of Hegyköz small region. It is in the Zemplén mountains close to Slovakian border. 57 % of the area is covered by deciduous forests. Agricultural fields are only on 25% of the total area in the valley. The main activities are forest management, agriculture, hunting and different kinds of tourism. More than half of the area is designated as national park or other Natura 2000 area.
Poland Zator	The district of Zator is situated within a region called the Carp Valley, which covers the area of a historical carp husbandry center. Fishing ponds are spread on hundreds of hectares in the valley of Skawa and Vistula rivers The district consists of the town of Zator and nine villages. The landscape is characterised by domination of agricultural land and fishponds. Forests are almost absent whilst some woodlands are scattered over agricultural areas and along borders of fishponds and roads.
Portugal S. Brás de Alportel	A hilly landscape covered by vast expanses of evergreen oak forests, ranging from almost pure cork oak stands to complex Mediterranean maquis with dominating cork oaks surrounded by tall strawberry trees <i>Arbutus unedo</i> and tree heath <i>Erica arborea</i> . Forest stands are often interspersed with nearly monospecific gum cistus <i>Cistus ladanifer</i> scrub or more diverse Mediterranean heathland. The main economic activity in rural areas is the production of cork, generally conducted on small private estates (<10 ha) by aged landowners (often > 60 years).
Romania Sfantu Gheorghe, Danube delta	A small village surround by large natural habitats including wetlands, coastline, wild beaches, natural levees and large river branch with high conservation interest, fishery, cattle breeding in wild & tourism.

Country/ Case study	Landscape
Turkey Camlihemsin, Firtina valley	The Firtina Basin is situated on the northern skirts of the Eastern Black Sea mountain range, the backbone of the West Lesser Caucasus corridor in Turkey. The valley is formed around the Firtina River and its two main tributaries altogether carrying the chilly waters of Kackar Mountains down to the Black Sea. It is a typical example of a number of rapid flowing river systems along the Black Sea coast, running parallel towards the sea. The slopes of Firtina Basin are probably among the steepest on earth, reaching up to 3,992 m, from the sea level within 45 km. The average annual precipitation is fairly high (over 2,000 mm) and the higher altitudes are covered by wet clouds most of the time.
Turkey Eğirdir	Eğirdir Lake Basin covers an area 3,309 km ² , including Lake Eğirdir whose maximum size is 479 km ² and maximum volume is 4,005 hm ³ . Lake Eğirdir has an altitude of 917 m and average depth of 10-12 metres. The lake is 50 km long on north-south axis, and 3-15 km wide on east-west axis. The mountains in the lake basin are partly covered by forests, dominated by pine and red pine, with random populations of oak, juniper, cedar and fir. The most significant plateau in the basin is Barla plateau, where soil is comprised of limestone and clay and the slope varies up to 40 %. Some significant plains, the most important of which is Boğazova, lie between the mountains.
UK Arne Parish, Dorset	A matrix of mainly grassland agriculture, lowland heath & woodland with villages, some extractive industry, high conservation interest & tourism.

3.3.1.1 Desk study

Each TESS partner country produced a 'synopsis' document giving textual detail on relevant aspects of the systems of local governance for environmental decision-making, the availability of suitable data to inform these decisions and information on communications and community engagement. These summaries also provided details of the environmental and social characteristics of each case study area.

The 'synopsis' documents gathered the following information:

- Case study details
- Synopsis of local environmental decision-making
- Environmental decision-making and the Local Administration
- Local Government Framework
- Local Government Role
- Local – Regional - National Government Links
- Local-Local Government Links and Community Engagement
- Planning for local environmental decisions
- Stakeholders - Who is involved in making and influencing local environmental decisions in your case study?
- Data used for local environmental decisions
- Local data on biodiversity and ecosystem services
- Regional data on biodiversity and ecosystem services
- National data on biodiversity and ecosystem services

3.3.1.2 Structured interviews– selection of interviewees

Each TESS partner also conducted a series of structured interviews with selected government and community representatives within their case study. Interviewees were selected from the two tiers of local government. Partners were guided to seek both officials and elected representatives where relevant in order to obtain responses with a good potential for reflecting the circumstances in that area. If possible, a number of officials with a range of roles were interviewed simultaneously and provided agreed responses to the survey questions.

In order to survey the functions of stakeholders in the community in environmental decision-making, a sample of individuals were found and interviewed within each case study. Stakeholder categories were agreed in a group discussion between TESS partners during the project inception. Input from all partner countries was necessary at this stage to enable the choice of categories which provided a good range of types of interest and activity. The main criteria for selection were that they were (i) widely engaged in managing land or species, or with potential for contributing to this, and (ii) ideally organised at national and European level, so that a single contact point in Europe could in principle arrange contacts at local level.

It was also important that most types of stakeholder would be likely to be represented within each study area. Although the ideal was for each partner country to locate a representative for each stakeholder category, in practice there were some case studies where the landscape type or economic activities in the case study made it necessary to omit certain categories.

The following categories were used and the typology of the interviewee's status (public/voluntary/ NGO/ non-profit/ private) was also recorded.

- Farming and rural business
- Forestry & non-timber products
- Fisheries and angling
- Hunting & recreational animals
- Nature watching and reserves
- Recreational access

Although an offer was made to contact stakeholders through federated national organisations at national level, in practice contacts were made locally. This was done either by direct knowledge of TESS partners within the areas or on advice from the local administration or the combination of these approaches.

3.3.1.3 Structured interviews - interview approach

Each interview consisted of initial contact and explanation of the aims of the survey to familiarise the interviewee(s) followed by a face-to-face visit by a TESS partner or representative. The representative worked through a 9 page survey form (Table 3.3) providing explanation where required. This approach allowed the project to cover a broad area within a complex topic that could not have been accomplished through a

more simple and limited unsupported questionnaire. The topics of the 9 pages dealt with the environmental responsibilities of the interviewee as an individual or a representative of an organisation, their community engagement and the way in which they used, or were unable to use, environmental information in their decision-making. The results from the survey forms were all subject to independent review by the work package team and were returned to each partner for clarification where necessary.

Table 3.3. Topics covered by the survey forms used during the structured interviews to gather information on environmental decision making in the TESS partner countries.

Page	Topic	Questions
1	Capabilities for nature conservation and management	13 plus details
2	What determines your needs for information when making decisions affecting the environment?	7 plus details
3	Participatory processes and objectives	14 plus details
4	Ecosystem Services: benefits of wild resources	13 plus details
5	Environmental costs and other issues within your administrative area	Open question
6	Environmental information sources for decision-making	6 plus details
7	What biodiversity and ecosystem services information do you need in order to make environmental decisions?	Matrix – 50 questions
8	Are you currently able to access the required data?	Matrix – 50 questions
9	Reasons for being unable to access any required data.	Matrix – 50 questions

3.4 Results and Discussion

3.4.1 Characteristics of the study areas

It was crucial to obtain contextual information on both the natural and socio-economic environment in the case study areas to enable interpretation of the differences and synergies between the ways in which environmental information was used in the partner countries. In this aspect of the TESS project the study was focussed on the two lowest levels of local government (as well as other individual stakeholders), so characteristics of the study areas were of interest within the administrative boundaries of these two levels (Tiers 1 and 2).

Governance systems varied between the countries (see section 3.3.1) but they always involved local authorities, such as municipalities or parish councils. There may also be strong governance from specialised government agencies, which may be identified as a Tier of governance for the purposes of this study (e.g. Greece Tier 2). Details of the local government system in each partner country are provided in Appendix A.

At the lowest level of government (Tier 1), the study areas ranged in size from 1,489 ha to 63,984 ha, with population densities varying between 2 and 176 per km², with a median of 46 per km² (Table 3.4). In comparison, the average density of the European Union's 490 million people on a territory of 4.46 million km² is 112 per km², close to 1 citizen per hectare.

The landscape types represented by the case studies also varied considerably, with some sites dominated by agricultural land, others by forestry, wetlands or heathlands (Tables 4 and 5). All study areas included parts that were designated for nature conservation but the extent of this area also varied from less than 10% to more than 50%. In comparison, Natura 2000 covers 17% of the land area of the EU.

This variety of case study types satisfied the requirements of this study to consider the use of environmental information in decision-making at a local level across a representative selection of case studies. With this approach, the range of results obtained is generally of more interest than generalities, such as average values for the survey questions.

Table 3.4. Summary of the characteristics of the TESS case studies with details for the area delimited by the most local level of government denoted as Tier 1 in TESS and generally listed by EUROSTAT LAU2 (previously NUTS 5).

	Estonia	Greece	Hungary	Poland	Portugal	Romania	Turkey	Turkey	UK
Case Study Name	Keila Parish,	NO TIER 1	Bózsza	Zator	S. Brás de Alportel	Sfântu-Gheorghe	Çamlıhemşin Firtina valley	NO TIER 1	Arne Parish
LAU	2		2	2	2	2	N/A		2
Area (ha)	17,900		1,639	5,144	15,337	63,984	1,489		2,962
Population (density/km ²)	4,700 (26)		205 (13)	9,026 (175)	10,032 (65)	971 (2)	1 457 (98)		1 370 (46)
% Area nature cons. designation	10		53 (Hegyköz)	60	52.3	35.7	Not available		65
Designations	Landscape Reserves Parks; Natura 2000; National Park		National Park	Natura 2000; Nature reserves	SPA, SCI	Ramsar ; SPA; SCI; UNESCO Biosphere Reserves; SAC	Not available		SSSI; SNCI; Ramsar; SPA
% Area other designation				60	65.5	64.2	Not available		96
Designations				Landscape Parks; Nature & Landscape Complex	REnc (National Ecological Reserve)		Not available		AONB
% area									
Agriculture	25		25	52	21.2	0	Not available		40.3
Forestry/ Woodland	42		57	6	41.2	17.5	Not available		13.4
Wetland /fresh water	7		Not available	22	1.0	80.8	Not available		18.8
Heath/ Moorland / Upland	0		Not available	0	33.1	0	Not available		11.2
Buildings & roads	2.5		Not available	Not available	3.6	0.3	Not available		2.9
Other land (e.g.)Coast	4.5 military; 1.7 mining					1.5 (levee, bare ground)	Not available		13.4

Table 3.5. Summary of the characteristics of the TESS case studies with details for the area delimited by the second most local level of governance denoted as Tier 2 in TESS and generally listed by EUROSTAT LAU1 (previously NUTS 4).

	Estonia	Greece	Hungary	Poland	Portugal	Romania	Turkey	Turkey	UK
Case Study Name	Keila Parish,	Municipality of Kerkini	NO TIER 2	Powiat Oświęcim	S. Brás de Alportel	Tulcea	Sub Governorship Çamlıhemşin	Eğirdir	Purbeck
LAU	2	1		1	1	NUTS3	N/A	N/A	1
Area (ha)	17,900	35,400		40,600	15,337	853,441	104,245	177,880	40 442
Population	4,700	10,037		155,000	10,032	256,491	6,747	39,064	45 199
% Area nature conservation designation	10	15.5			52	7.1	63	31	29
Designations	Landscape Reserves Parks; Natura 2000; National Park	Ramsar, Natura 2000		Natura 2000; Nature Reserves	SPA; SCI	Ramsar Site; SPA; SCI; UNESCO Biosphere Reserves; SAC	National Park and Wildlife Reserve	Drinking Water Reservoir; Natural SIT Area; National Park	SSSI; SNCI; Ramsar; SPA; SAC
% Area other landscape designation					65.5	92.9	37		73
Designations				Protected Landscape; Landscape Parks; Nature & Landscape Complex	REN ^c (National Ecological Reserve)				AONB; Greenbelt
% area									
Agriculture	25	29		55	21.2	42.9	0.3	37	62.5
Forestry/ Woodland	42	57		11	41.2	16.1	63	47	17.0
Wetland /fresh water	7	9		Not available	1.0	30.9	0.2	13	3.8
Heath/ Moorland / Upland	0			0	33.1	0	36.5		10.3
Buildings & roads	2.5	4		Not available	3.6	3.2	Not available	3	2.7
Other land (e.g., coast)	4.5 military; 1.7 mining				0	6.9 (lagoon, bare ground)	Not available	0	3.7

3.4.2 Environmental decision-making at the local level

The WP3 aims included identifying local environmental information needs. To do this, the survey needed to determine who was making local decisions, the key issues that concerned them, and the nature of their *perceived* information needs.

3.4.2.1 Who requires information?

Across the study areas, a great range of organisations and individuals were identified who would be involved in either making decisions about the environment due to their role as land managers or who would seek input to environmental decisions (Table 3.6). The six stakeholder groups identified for the structured interviews (see Methods) provide a good representation across the range identified here.

Table 3.6. Categories of decision makers defines in the TESS case study areas – combined for all areas.

LAND MANAGERS			
Private	Public	Community	NGO
Farmers,	Government -all levels	Local associations: farming, fisheries, hunting,	Nature conservation
Foresters,	Government agencies: environment, nature, water, sustainability, heritage, agriculture and rural affairs	Local partnerships- e.g. for nature and heritage conservation	Wildlife
Horticulturalists,			Ornithology
Extractive Industry,			Heritage
Sport fishery /Anglers	National parks	Village boards and partnerships	Hunting
Hunters	Forestry		
Aquaculture	Research institute		
Tourism			
Recreation			
INTEREST GROUPS			
Commercial	Environmental groups	Recreational groups	Community groups
Tourism including ecotourism & agrotourism	Wildlife and nature conservation	Tourism	Residents association
	Green movement	Recreation	Women's groups
Extractive industries	Ornithology	Access to land	Farming / forestry / angling and hunting associations
		Outdoor sports (e.g. cycling, canoeing, skiing, horse-riding)	Local heritage association
		Gardening	Volunteer fire fighters

3.4.2. What activities occurred in the case studies that might require environmental information?

Within the structured interviews a range of questions were asked to determine levels of engagement with environmental management, and particularly, nature conservation. Both Tiers of government had responsibility for the management of some aspect of the environment. When questioned in detail, fewer engaged specifically in conservation management and protection of wild species/habitats and even fewer in restoration of species/habitats. Notably a higher number of Tier 2 local authorities engaged in environmental restoration and protection (Figure 3.1).

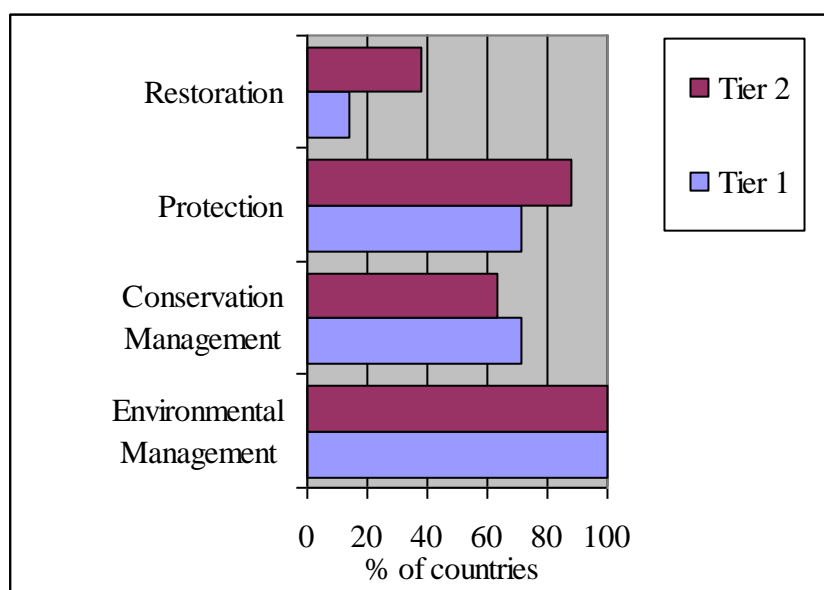


Figure 3.1. Proportion of local government representatives who perceive their tier of local government to be responsible for different aspects of environmental management.

Collectively, 75% of the individual stakeholders stated that they had responsibility for some form of environmental management. This proportion was lower for conservation management and protection of wild species (44%) and for restoration of wild species and habitats (30%). This reflects the general pattern shown by Tier 1 of Local Government. Forestry, hunting and nature conservation showed most engagement in all categories. A perceived responsibility for nature conservation management was recorded for fewer than half of the case studies for the stakeholder categories access, fishing (angling) and farming (Figure 3.2).

Interpretation of the results may be aided by noting that the Nature Watching and Reserves category of stakeholders combined groups with considerably different needs. It may have been helpful to consider nature reserves separately for a clearer analysis. In this case, it is unlikely that the nature reserves category would have lower than 100% responsibility for conservation management, there might however, be differences in engagement with protection and restoration work.

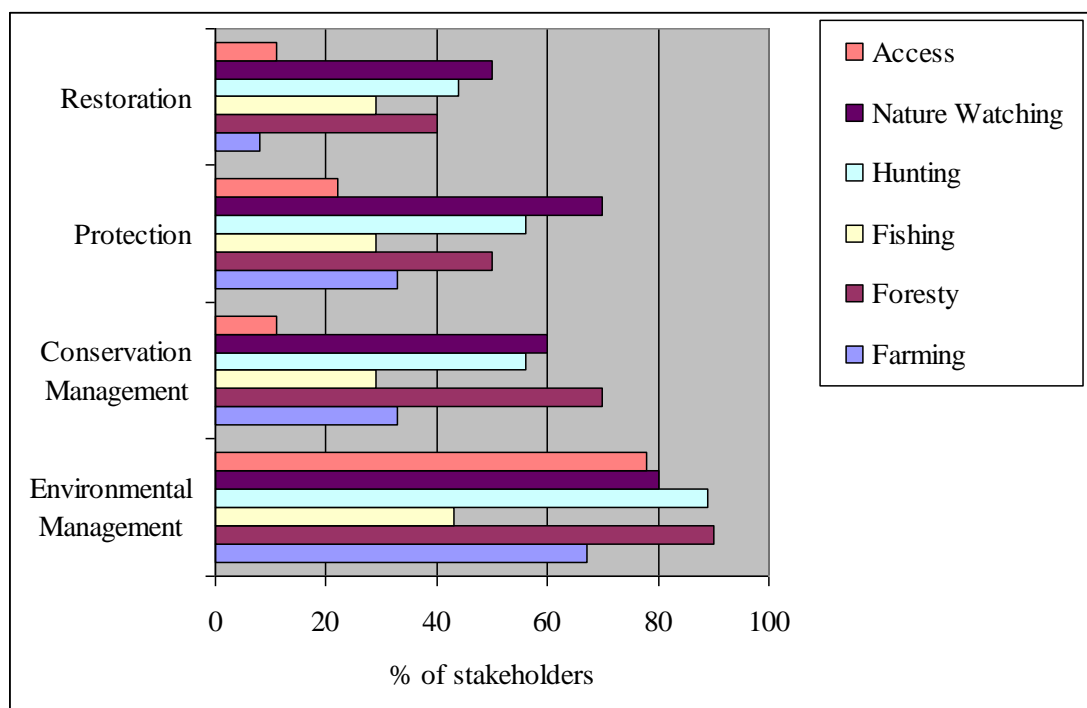


Figure 3.2. Proportion of individual stakeholders that stated responsibility for different aspects of environmental management.

Estimates of the numbers of environmental decisions made by interviewees and the organisations they represented varied considerably. This needs to be interpreted with caution, as although the interviewer would aim for consistency, there may be differences in the ways in which the decisions are estimated. For instance, there may be different definitions of what constitutes a single decision. Despite this caveat, it is clear that there were considerable differences between countries with some reporting zero or 1 decision and others very many, with median values between 6 and 33 per year. With regard to formal and informal decisions, a broad range of responses were found across both Tiers although one may discern a higher propensity for 'informal' decisions at Tier 1 level and a higher number of 'formal' decisions at Tier 2 level (Table 3.7).

Table 3.7. Estimated numbers of decisions on environmental matters made annually by local government and other stakeholders in the partner countries.

	Formal planning decisions			Informal decisions		
	Min	Max	Median	Min	Max	Median
Tier 1	0	50	10	0	300	16
Tier2	1	700	33	0	50	8
Stakeholders	n/a	n/a	n/a	0	365	10

The number of decisions made by the interviewees is likely to be affected by the characteristics of the area that they manage, including the total area. The area managed varied considerably from a minimum of 8 ha to a maximum of 42,000 ha.

When the number of decisions is considered in the context of area, relative number of decisions made by farmers is by far the highest of any of the groups studied (Figure 3.3). This also should be interpreted with caution due to the many possible

interpretations of a decision. All decisions will not have equal importance and it may well be that a single decision made by a stakeholder managing a large area may have far greater consequence than a large number of minor daily decisions.

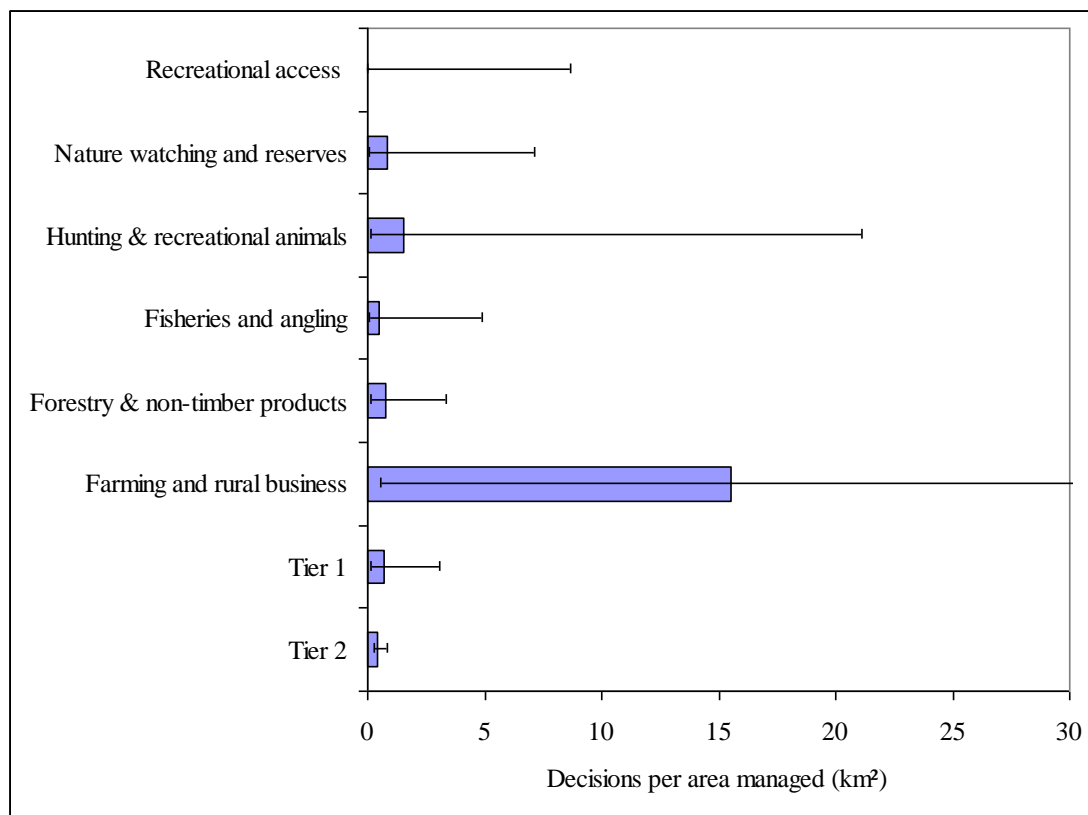


Figure 3.3. The number of decisions that affect the environment made per area managed for each stakeholder category and tier of local government.

Interviewees were asked, when making formal and informal decisions, what percentage of time is spent on consideration of the environment, society, jobs, costs and other matters. Tier 2 Authorities spent a higher percentage of time considering environmental matters whilst Tier 1 Authorities' considerations were dominated by societal issues. The greatest proportion of time, for the individual stakeholders, is spent on economic considerations (Figure 3.4).

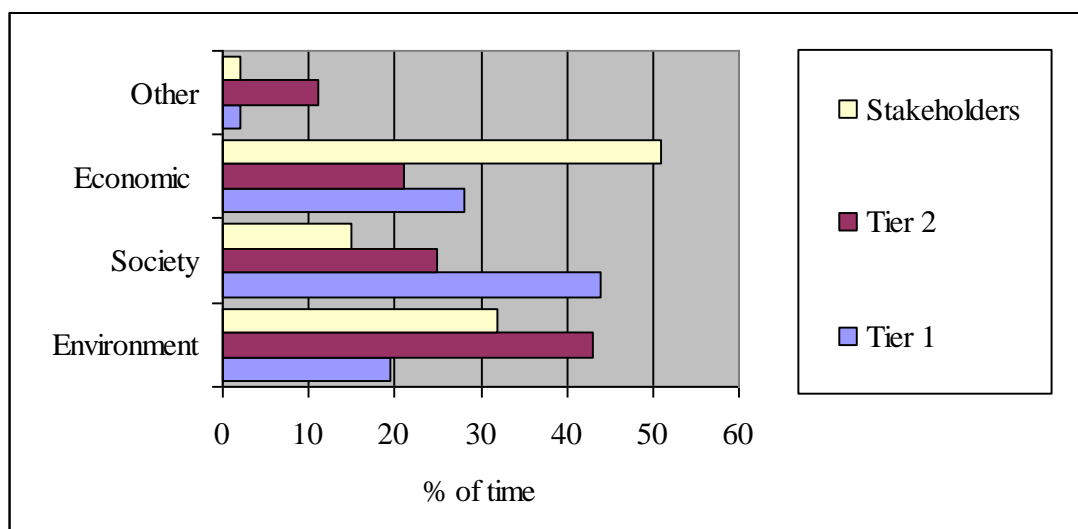


Figure 3.4. Proportion of time estimated by interviewees to be spent on environmental, social and economic considerations.

3.4.2.3 Engagement with statutory requirements for impact assessment

Tier 2 governments in the case studies indicated a higher propensity to engage with the Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) processes (Figure 3.5), much as would be expected, since these are statutory requirements requiring a degree of professional expertise and staffing not commonly employed at the very 'local' level of government.

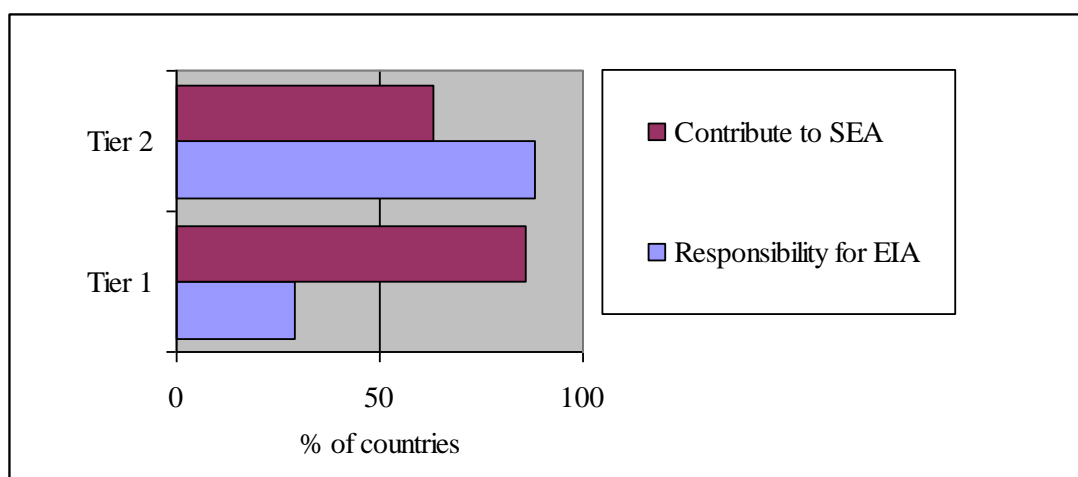


Figure 3.5. Proportion of local government interviewees who responded that their authorities were responsible for EIA and engaged with SEA.

3.4.2.4 What are the key issues in environmental decision-making?

In the structured interviews, respondents identified key issues for which environmental information would be needed to enhance decision-making capacity. These issues were clearly influenced by the natural and cultural environment of each case study, and typical examples included impacts of extractive industry, flood risk,

water quality, water supply and tourism / recreation impacts. The issues could be categorised in a number of ways.

For the TESS project it was particularly pertinent to group the issues by subject categories that are compatible with *categories of predictive models* suitable for integration into the TESS decision support system design. This categorisation, used also in WP4, was based on increasing complexity from a basis of air, water and soil through associated fauna and flora, which combined in ecosystems and then added human social and economic categories. This categorisation indicated that the highest proportion of issues identified by both tiers of government were socio-environmental issues. This may somewhat reflect the greater breadth of this category in relation to the others. However, it does show that the interviewees framed their issues in a sense that acknowledged links between natural and cultural systems (Figure 3.6).

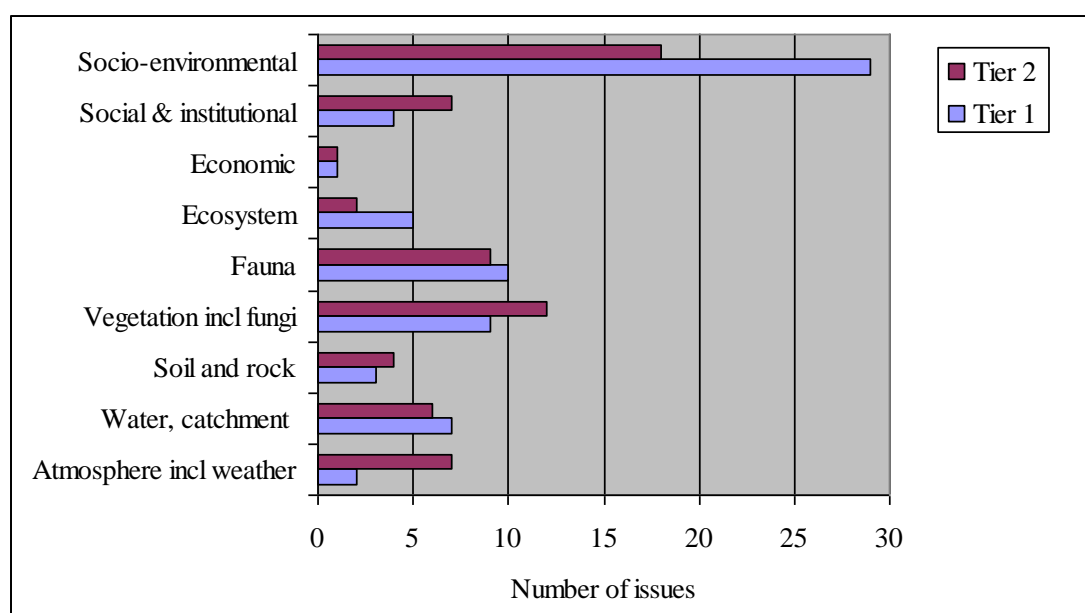


Figure 3.6. Environmental issues identified by representatives of local government in the partner countries sorted into subject categories compatible with categories of environmental models used to analyse and predict the impacts of decisions in TESS WP4. Each issue could be assigned to more than one category.

The issues identified by interviewees were also categorised into subject areas that relate to the provision of ecosystem services and environmental hazards. There were very strong differences in the number of issues in the different categories, with physical hazards rating by far the highest for the most local tier of government reflecting the need to respond to immediate needs of the local population. These hazards include flood or drought risk as well as water, air and noise pollution. Similarly the Tier 1 administrations showed a concern for amenity areas not reflected so strongly by the next tier of government. Biodiversity conservation issues and tourism / access were frequently listed as important issues by both tiers of government but heritage conservation, surprisingly, was not listed. Issues relating to the provision of ecosystem services (e.g. forestry, fishing) were also rarely reported by government, perhaps because seen as commercial concerns (Figure 3.7).

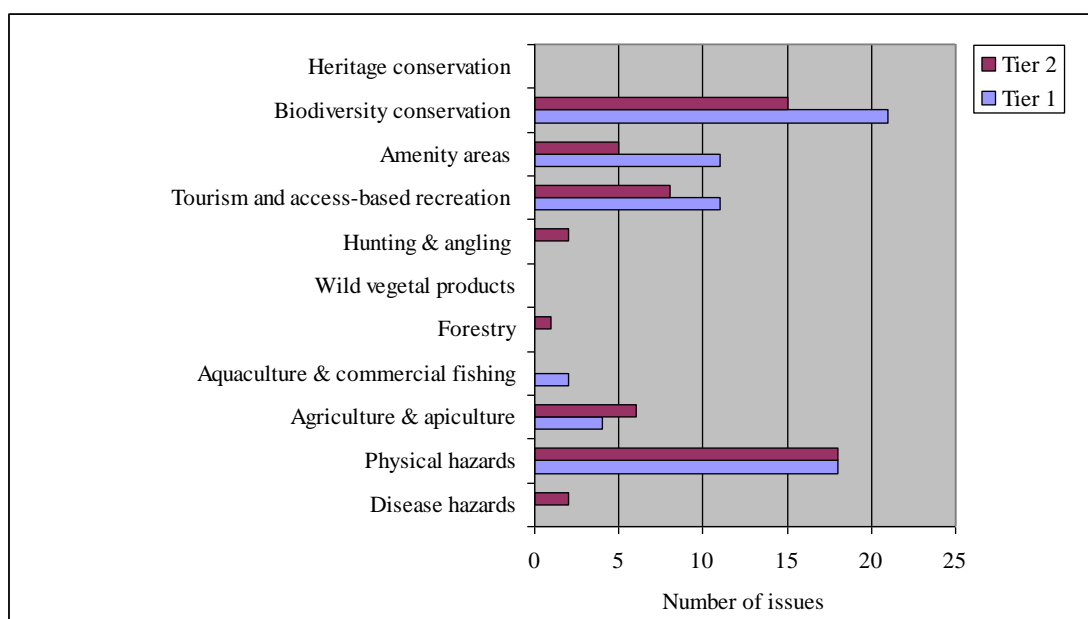


Figure 3.7. Environmental issues identified by representatives of local government in the partner countries sorted into subject categories relating to the provision of ecosystem services and environmental hazards. Each issue could be assigned to more than one category.

3.4.3 Participatory approach and community engagement

The nature and extent of community participation varied between countries, although the majority of local government respondents purported to engage to some degree with individuals, enterprises, NGOs and government agencies. Interviewees were asked to state the way in which they engaged in consultation and the participatory process with a choice of responses of never, occasionally, often, usually, always, and mandatory. This enabled a comparison to be made between the perceptions of the local governments and the individual stakeholders regarding the efficacy of this process.

The data were summarised using an index to represent each action (e.g. consultation, participation) for each data set.

Index = \sum responses x weight,

Where weight = Never = 0, Sometimes = 1, Usually = 2, Often = 3, Always = 4 and Mandatory = 4⁴)

At the lowest level of government (Tier 1) the highest response rate across case studies was 'usually', although two countries reported that they 'never' engaged in consultations and actions for participation with private individuals and enterprises. At the second level of government (Tier 2), three countries stated that consultation and participation were 'mandatory' and none claimed 'never' to consult or engage the community. This pattern of responses would suggest that there might be a greater

⁴ NB. 'Always' and 'Mandatory' received the same score to avoid bias of a higher index to the local governance. The mandatory option was not available as a response on the 'individual stakeholders' survey forms.

commitment or compulsion in Tier 2 levels of government to embrace a participatory approach with individuals and enterprises (Figure 3.8).

In contrast, the highest response rate across all individual stakeholders to the same questions was 'occasionally' or 'never' thus representing a mis-match between the responses of local government and perceptions of the stakeholders. This pattern varied somewhat between groups of stakeholders with fisheries/angling and farming interests appearing particularly excluded (Figure 3.8).

This raises the question of the efficacy of the participatory processes used by local government, although it should be recognised that when consultees are dissatisfied with decisions or policy outcomes, the perception is often that the consultation process is flawed and their views have not been taken into account. Also, local governments may have a perception of regular consultation based on their outreach activities across many stakeholder groups; however, each individual may perceive this as much less regular.

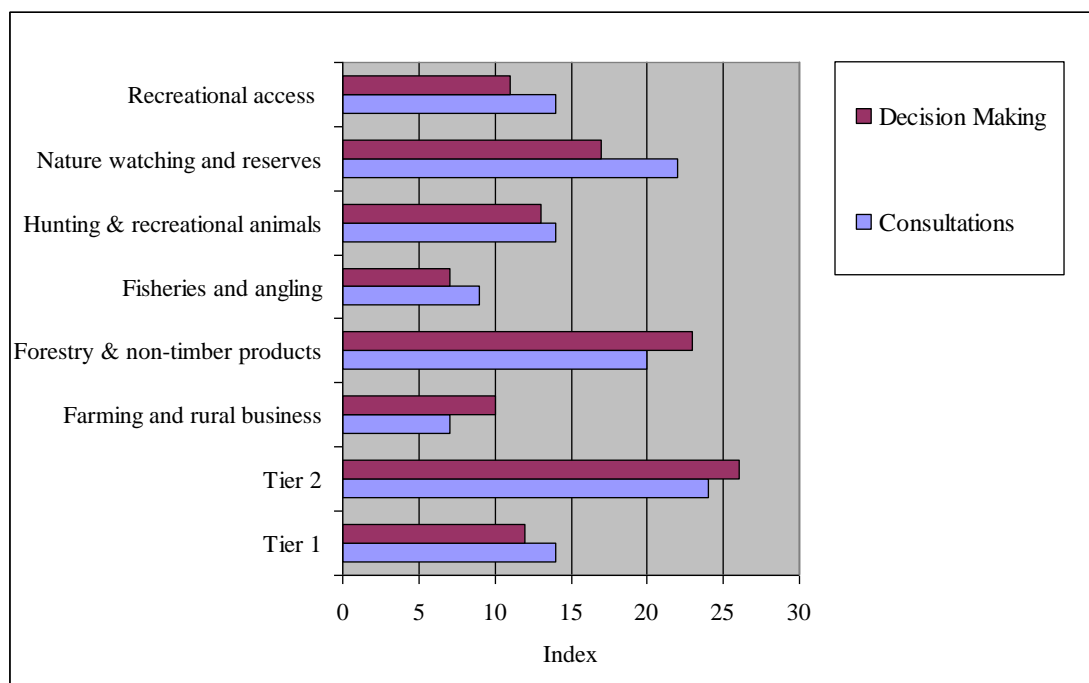


Figure 3.8. Perceptions on whether consultations are held and whether positive actions are taken to enable participation on environmental issues, using an index based on the individual responses where a high value indicates high participation. Responses are collated across case studies for representatives of local government (Tier 1 and Tier 2) and individual stakeholders.

The pattern of consultation fitted quite strongly ($P = 0.02$) with the proportion of respondents that were private, as opposed to public bodies, NGOs or non-profit organisations, in each stakeholder category. Although the samples of 6-10 stakeholders in only 6 categories is small, it seems that consultation tends to be least when the stakeholders are predominantly in the private sector (Figure 3.9).

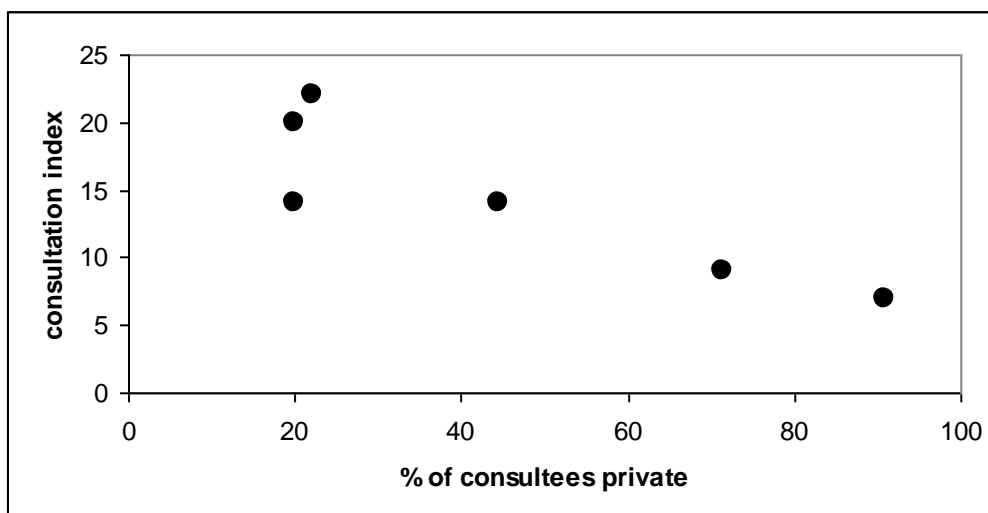


Figure 3.9. There was least consultation by administrations with stakeholder categories that were predominantly private.

Examination of the engagement of local governments and individual stakeholders with government conservation agencies and conservation NGOs was addressed using a similar set of response options and summary index (Never = 0, Sometimes =1 etc.) (Figure 3.10). For areas designated for nature conservation, government conservation agencies were thought to be consulted to some degree by all countries, at both levels of local government. However, these responses showed a considerable range across the 9 case studies. For instance, consultation by Tier 2 government with government agencies was a mandatory requirement in 3 cases, but only occasionally conducted in another 4 cases. The responses for consultation requirements in non-designated areas were also diverse. All groups of individual stakeholders engaged to some degree with the government conservation agencies and conservation NGOs but this varied between groups, with Nature Watching/Reserves and Forestry respondents showing greater likelihood of consultation (Figure 3.10).

Engagement with conservation NGOs, was perceived to be less frequent than with government agencies across all groups of interviewees including local governments and individual stakeholders (Figure 3.10). Engagement with these NGOs was most frequently perceived as “occasional” by all groups of stakeholders. Notably, 30% of the individual stakeholders said they ‘never’ engage with conservation NGOs in non-designated areas and 38% purported to ‘never’ engage with them in designated areas.

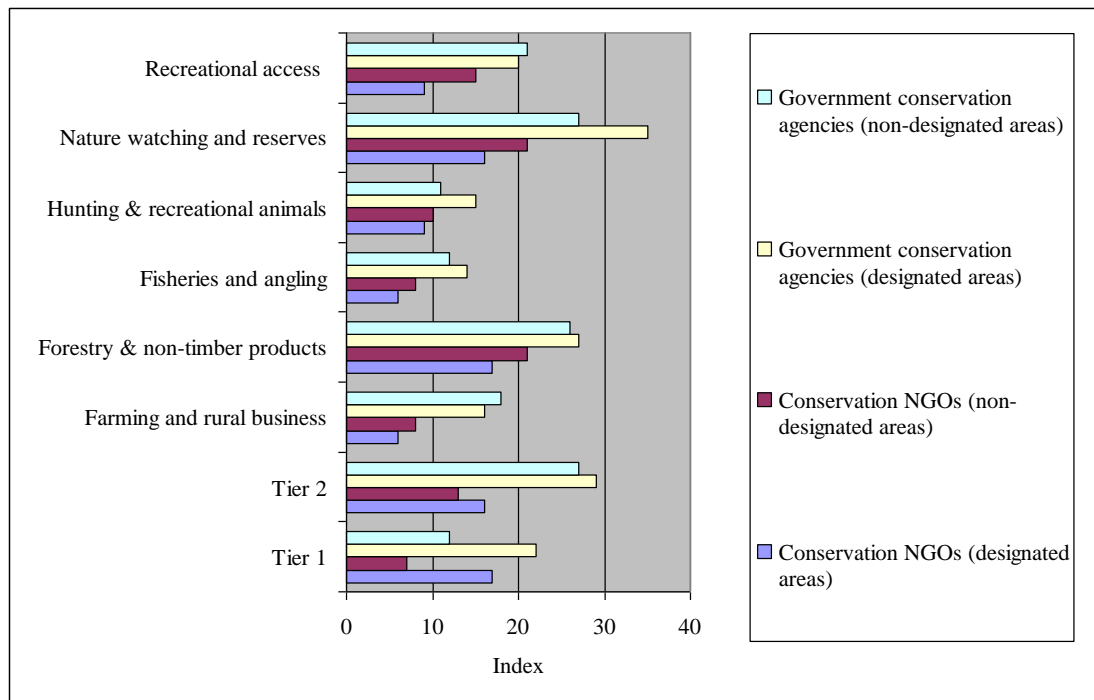


Figure 3.10. The degree to which local government representatives and individual stakeholders engage with conservation agencies and NGOs, using an index based on the individual responses where a high value indicates high participation. Responses are collated across case studies for representatives of local government (Tier 1 and Tier 2) and individual stakeholders.

When questioned on whether government agencies, conservation NGOs or pressure groups were able to exert *greater* influence on environmental decisions in relation to their own influence, a contrast was evident between local governments and the individual stakeholders (Figure 3.11). Local governments, at both tiers, perceived that government agencies exerted some influence, NGOs were thought to have less (generally occasional) influence and pressure groups were rarely perceived as being influential. In contrast, stakeholders affirmed the influence of government agencies but indicated that they also considered pressure groups to be influential (Figure 3.11). Interestingly, the individual stakeholders, in general, indicated that the influence of the various groups over environmental decisions was more significant than was reported by the local government respondents (Figure 3.11). This probably reflects a feeling of exclusion from participation in decision-making experienced by some individual stakeholders.

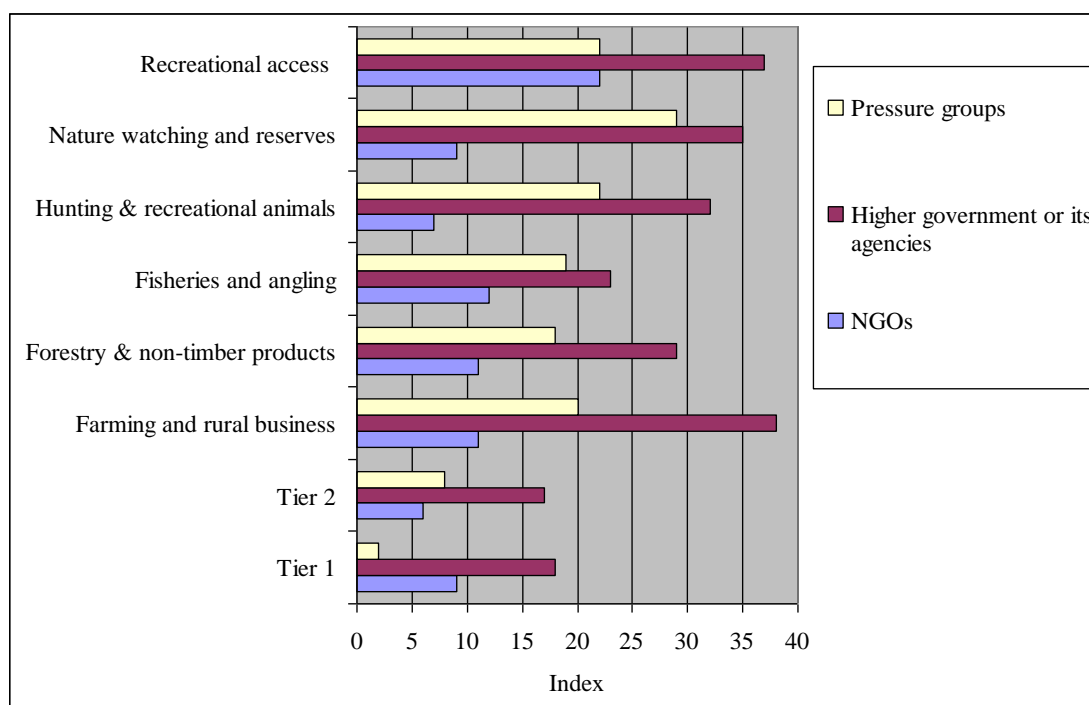


Figure 3.11. Degrees of influence by other groups (pressure groups, higher government and its agencies and NGOs) on local environmental decisions, using an index based on individual responses, where a high value indicates high participation. Responses are collated across case studies for individual stakeholders and representatives of local government (Tier 1 and Tier 2).

3.4.4 Information sources for environmental decision-making

For each partner country, the TESS survey examined the information sources that are available for environmental decision-making (Table 3.8), and then used the structured interviews to determine the information that was used by the different societal sectors to approach a variety of local issues that were identified by the interviewees.

There were major differences in information provision between the partner countries at the national, regional and local levels (Table 3.8). While national and regional databases of biodiversity and other environmental information are available in some partner countries (e.g. Portugal, UK), in others, the data were more fragmented in nature. Where national databases were available some limitations to their use may result from scale issues, such as aggregation to a scale too coarse for many purposes. Some data may be held by various government organisations and agencies but may not be available in databases that are accessible to all potential users. There are often partnerships between governmental ministries, agencies, and NGOs to develop environmental databases (e.g. Biodiversity Action Plans).

At the local level, many partner countries reported poor data availability, with uncoordinated data collection by disparate groups, resulting in a lack of compatibility and interoperability. Some data were subject to restricted access due to commercial restrictions or because it was not available in electronic format. Data in all countries originated from many local sources, including private commercial companies, NGOs and unofficial records kept by individuals. From the partner countries only Portugal and the UK reported coordinated data repositories at the local level for their study areas.

Table 3.8. The main information sources available for biodiversity conservation and other related environmental decision-making identified for each TESS partner country.

	Local	Regional	National
Estonia	Local government & enterprises (voluntary or compulsory)	No facilities for collecting, storing & providing biodiversity & other environmental data.	National environmental monitoring programme
Greece	Local municipalities, management authorities, local environmental groups & communities	The Prefectures keep official records mainly on hunting, tourism & forestry (about both species & services).	No national database. Forest inspection agencies, other government agencies, local municipalities, management authorities, environmental groups & NGOs.
Hungary	Poor & scarce data on local level. Databases MEPAR /forest management database /NATURA 2000) are not compatible on local level. Local municipalities and environmental NGOs could have fragmented information	National Parks , regional inspectorates for environment, nature and water.	Green-Point Service of the Ministry of Environment & Water & Vegetation Heritage of Hungary . Under development: The Conservation Information System
Poland	Do not currently exist. No comparable & comprehensive databases on local level. Major mapping efforts are planned for Natura 2000 areas	No specific facilities. Research institutes & regional authorities, administration of protected areas & NGOs.	Natura 2000 network & GRID Center of UNEP . Under development: Integrated Monitoring of Natural Environment & Biodiversity Clearing House Mechanism
Portugal	Local government (local Biodiversity Action Plans/plans in urban biodiversity), local business (Business & Biodiversity initiative) & eNGOs	Regional development & coordinating commission, although the information is not organized in accessible databases.	Portuguese network of protected areas , Natura 2000 network , national conservation agency (digital library), eNGOs & environmental consultancies.
Romania	Local public institutions (representatives of environmental authorities, national research institutes) & NGOs.	Regional agencies & institutes	National government agencies & national research institutes
Turkey	Local government agencies (local directorates of ministries etc.), universities, regional governmental research institutes, & stakeholder groups (eg. farmer unions)	Universities, regional governmental research institutes (eg. Eđirdir Fisheries Research Institute), regional government agencies, regional NGOs	Universities, governmental research institutes, national databases (Turkish Statistical Institute etc.), government agencies, national NGOs
UK	Local Record Centres (LRCs)	Regional information gateways & government agencies	National Biodiversity Network Gateway , online national databases (MAGIC / MarLIN)

3.4.5 Types of information required for environmental decision-making

Interviewees were provided with a matrix of types of information and requested to indicate which were required (see Methods, Table 3). These categories could be grouped into biodiversity and habitat information and the four types of ecosystem services as defined by the Millennium Ecosystem Assessment (MA 2005) (Figure 13.2).

It was evident that all of these broad categories of information were required to varying degrees by all the groups of stakeholders with the two tiers of local government and the nature watching and reserves stakeholder group and the forestry group showing the greatest overall need for information.

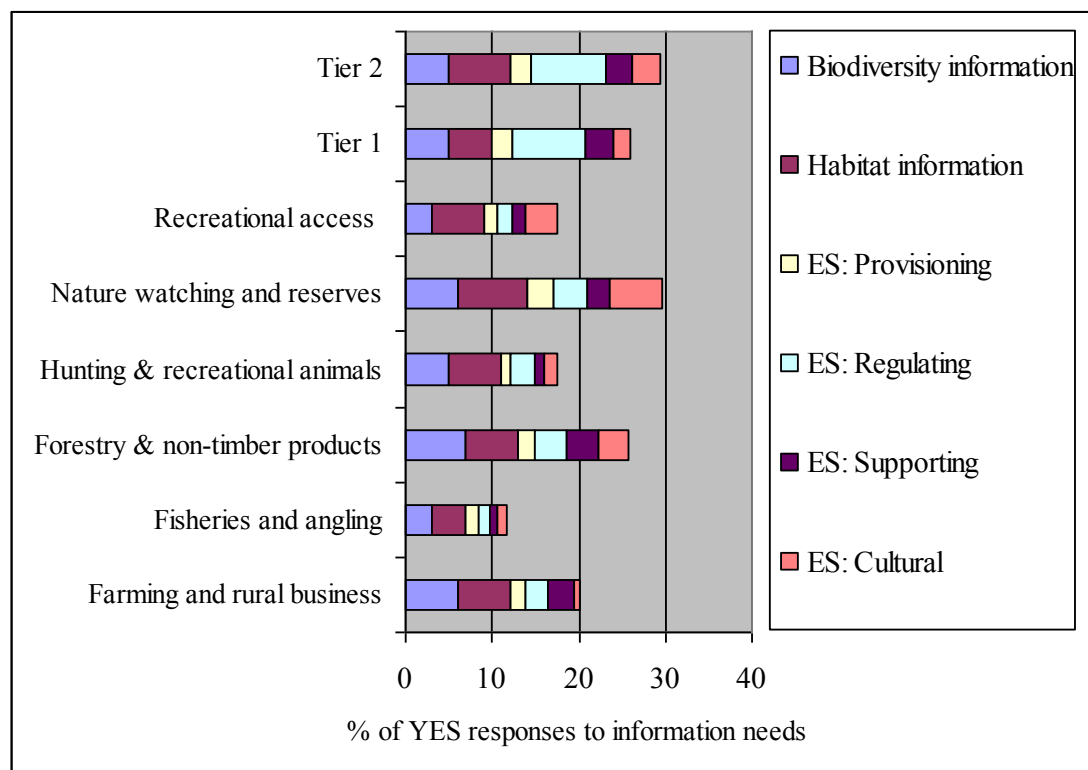


Figure 3.12. The types of environmental information needed by the different categories of stakeholders and representatives of local government (Tiers 1 and 2), categorized by biodiversity information and ecosystem services (ES). The results are combined for all case studies.

The data types within each of the broad categories varied in the level of perceived requirement. There was a frequent requirement for nationally or internationally protected species and habitat data but less for locally protected species and pests (Tables 3.9 and 3.10). In terms of ecosystem services, commonly required information included that relating to water, wild meat and fish, and fibre (e.g. timber), disaster management (e.g. floods), and *capacity* for tourism and recreation. Less commonly required was information on wild plants and fungi, cultivated crops, soils and *impacts* of tourism and recreation (Table 3.9 and 3.10). This is consistent with the generally greater emphasis in decision-making on social and economic than environmental factors (Figure 3.4). Requirements across all data categories were higher in Tier 2 than in the most local level of government (Tier 1) (Table 3.10).

Table 3.9. Categories of information selected by interviewees as required for their environmental decision-making. All interviewees including government representatives and other stakeholders are combined. Econ. = Economically.

	Data types more frequently required > 5 positive responses	Data types less frequently required < 5 positive responses
Biodiversity information	Species data (any) Protected species data (any) Nationally designated species Internationally designated species Native invasive species Non-native invasive species Habitat maps (any) Locally designated habitats Regionally designated habitats Nationally designated habitats Internationally designated habitats	Locally designated species Regionally designated species Wild pest species (agricultural) Wild pest species (health) Wild pest species (other)
Ecosystem Services: Provisioning	Econ. exploited wild species (mammals/birds) Econ. exploited wild species (fisheries) Cultivated forest products (timber, fuels) Livestock Aquaculture Air quality Water availability Water quality (and pollution)	Econ. exploited wild species (plant food/medicine) Econ. exploited wild species (plant materials) Econ. exploited wild species (fungi) Econ. exploited wild species (other, please state) Cultivated food crops
Ecosystem Services: Regulating	Flood risk / protection Fire risk / protection Risk of disease (wildlife to people) Risk of disease (wildlife to domestic animals)	Soil fertility Soil quality Soil retention (erosion risk) Pollination Pest control (e.g. predators of crop pests) Carbon storage potential
Ecosystem Services: Cultural	Amenity areas (parks, paths, verges) Tourism capacity Recreational capacity	Access Impacts of tourism Impacts of recreation

Table 3.10. The percentage of each of the categories of interviewees stating that they required specific information types with all countries combined and information categories combined / sampled* for brevity. Shaded cells show highest requirements (>60%).

		Tier 1	Tier 2	Farming	Fishing	Forestry	Hunting	Nature watching	Access
Biodiversity information	Species data (any)	71	63	50	40	75	67	80	67
	Protected species data (any)	57	75	25	40	75	56	80	67
	Locally designated species	43	38	8	10	50	22	40	33
	Regionally designated species	29	38	8	10	38	22	30	33
	Nationally designated species	29	63	17	30	63	44	60	33
	Internationally designated species	43	75	25	30	50	56	70	33
	Wild pest species (all)**	43	38	25	30	50	33	20	33
	Invasive species**	29	38	33	30	63	44	50	22
	Habitat maps (any)	71	88	50	30	88	56	60	33
	Locally designated habitats	57	63	33	10	100	44	50	33
	Regionally designated habitats	57	63	25	0	63	33	40	22
	Nationally designated habitats	43	75	17	10	63	33	70	33
	Internationally designated habitats	29	75	25	20	50	44	70	22
Ecosystem Services: Cultural *	Amenity areas (parks, paths, verges)	86	50	0	10	50	22	60	44
	Tourism capacity	86	63	0	10	63	11	70	44
	Recreational capacity	71	75	8	20	38	11	60	44
Ecosystem Services: Provisioning*	Economically exploited wild species (all)**	57	38	25	50	63	67	60	33
	Cultivated crops/ forest products **	29	38	33	10	88	33	30	11
	Livestock/Aquaculture **	71	63	25	20	25	11	30	11
Ecosystem Services: Regulating*	Flood risk / protection	100	63	25	30	50	22	70	33
	Fire risk / protection	86	75	42	20	100	44	60	33
	Risk of disease from wildlife to people	71	50	8	10	50	44	40	22
Ecosystem Services: Supporting*	Soil quality	57	63	42	0	75	22	30	22
	Soil retention (erosion risk)	57	63	25	0	75	22	20	22
	Water	71	38	8	30	38	0	40	33

** Maximum % values are cited for the group of categories (e.g. maximum of 2 categories for cultivated crops and forest products)

3.4.6 The determinants of information needs

The survey was designed to investigate the determinants or ‘drivers’ behind the information needs identified by the interviewees. For instance, local governments may have a requirement for information to inform EIA or SEA or land use planning (LUP) decisions.

The need for environmental information may be driven by a number of factors e.g.

- to comply with policy requirements
- land management
- nature conservation
- control of wild species / habitats e.g. agricultural pests or scrub encroachment

There was little difference between the groups of interviewees in their perception of the determinant of information requirements (Figure 3.13). It was interesting that all groups appeared to feel that statutory requirements and local policy requirements were important reasons behind their need for information. It may be that redesigning the survey could refine this result. Some interviewees may have given answers reflecting their perception of the reasons that would *in theory* influence data requirements without reflecting on the actual drivers behind their information needs *in practice*. Only just over 50% of the interviewees felt that nature conservation needs determined their information requirements (Figure 3.13).

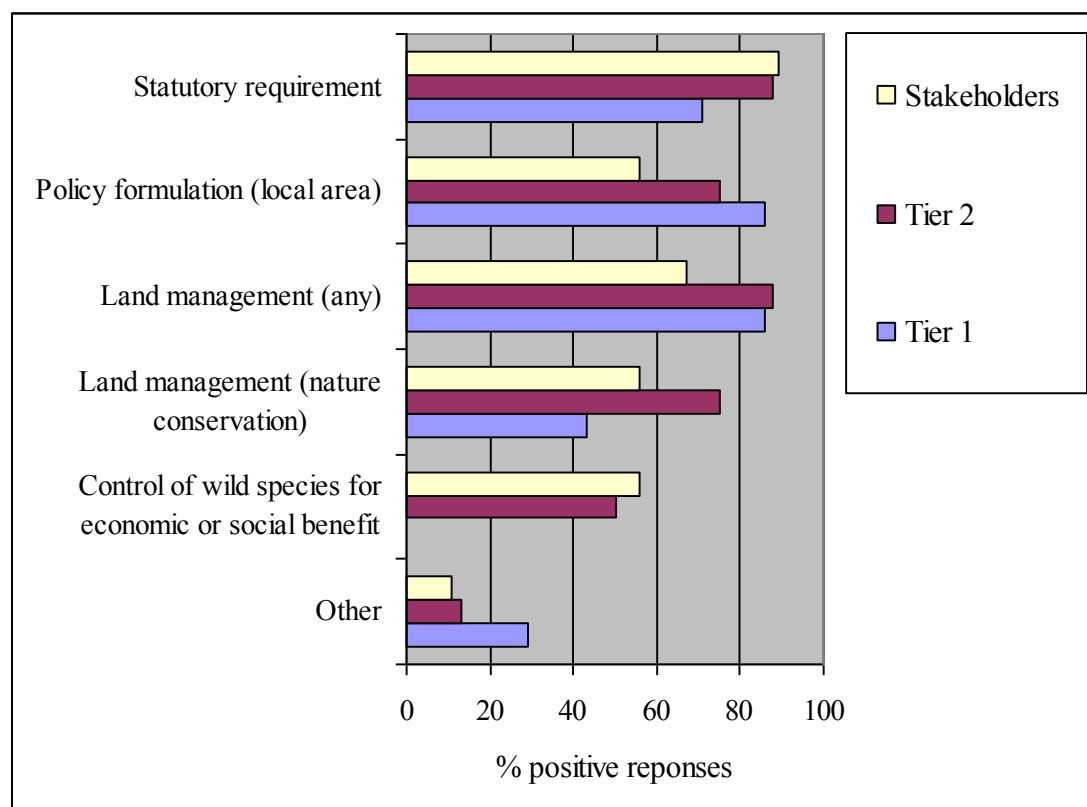


Figure 3.13 Determinants of environmental information needs with data combined for all case studies.

3.4.6.1 Requirement for EIA

The survey also considered to what extent local governments perceived a need for information to inform EIA. For each of the data categories (biodiversity and ecosystem services), interviewees were asked to consider whether the data they required was *also* needed for EIA. Notably, a relatively small proportion of the total required data was also required for EIA. Overall, only 23% of the required data were also required for EIA (Figure 3.14).

Biodiversity (species and habitat data) and provisioning ecosystem services data were required by many countries for EIA – however, even for these categories, more than half of the case studies responded that they were not required for EIA. Data that fell within the remaining three broad categories of ecosystem services (regulating, supporting, cultural) were rarely perceived as required for EIA (Figure 14). The low perceived need for data for this purpose is clearly related to the low degree of involvement in EIA and SEA in the Tier 1 governments. A large proportion of Tier 2 government interviewees, however, expressed a responsibility for EIA (Figure 3.5). It is therefore more surprising that many appeared to have a lower need for information for this purpose. This may be a function of interpretation. Interviewees may have assumed that they did not require the data because consultants perform the survey as assessment work. Further work would need to ensure clarification of this point to capture information needs even when these are mediated through consultants. However, administrations clearly felt a much greater need for environmental information for other purposes than for EIA.

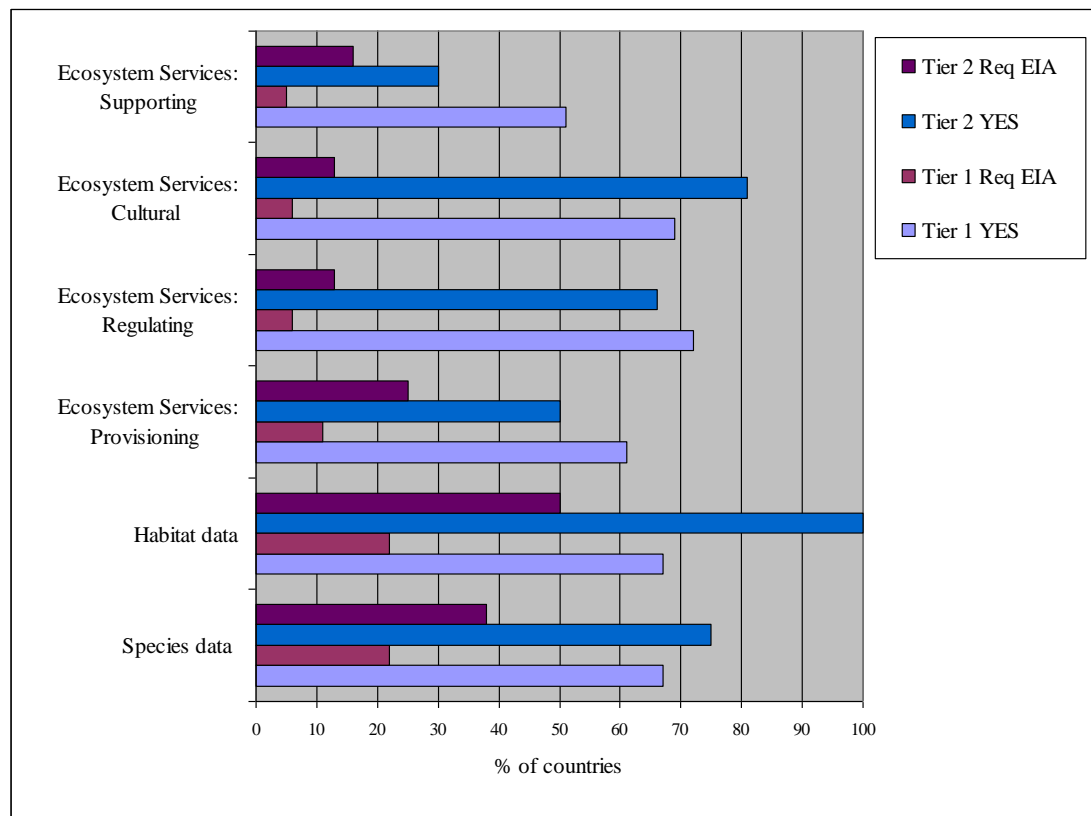


Figure 3.14. Data categories that were noted as required by interviewees for any purpose (YES) and that were felt to be necessary for Environmental Impact Assessment (Req EIA).

3.4.7 Information used for environmental decision making

The information sources used for addressing the environmental issues identified in section 3.4.2 (Environmental decision-making at the local level) were categorised into sources of environmental data in order to investigate where the decision-makers were acquiring the necessary information. The main source of information for both tiers of government came from records held within the local governments themselves, closely followed by legislation and information held at the national and regional level of government. Local knowledge was used more in Tier 1 than Tier 2, who relied more upon private consultants and advisors. Government agencies and NGOs were used more by the Tier 1 administrations (Figure 3.15).

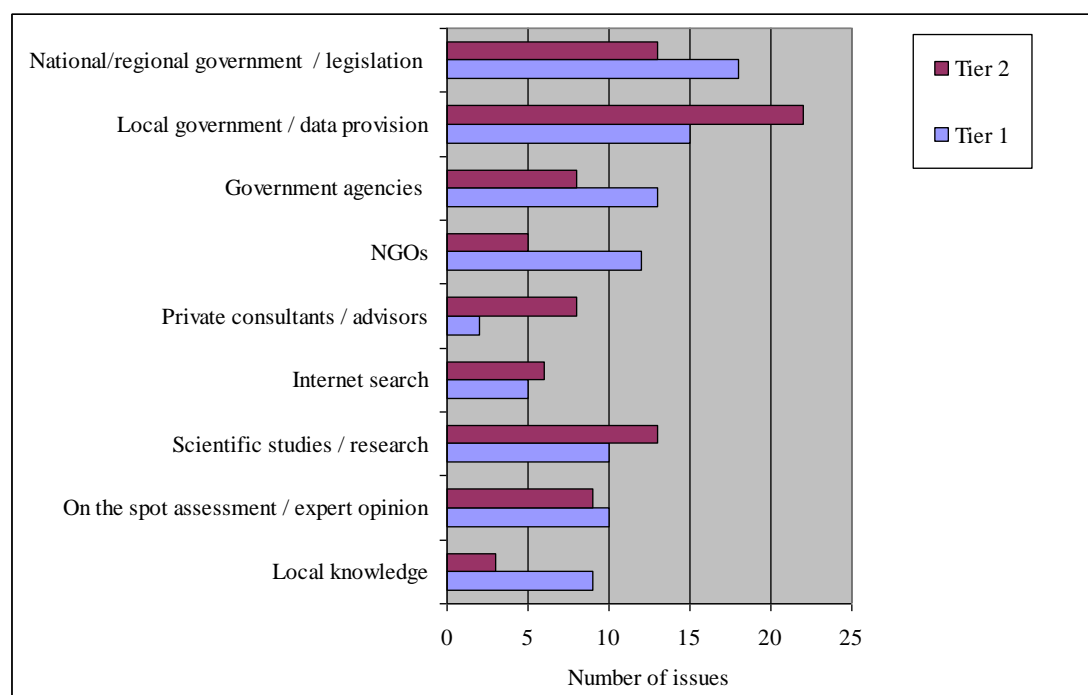


Figure 3.15. Sources of information used by representatives of local government to address the key issues that they identified for environmental decision-making. Multiple categories of information sources may have been selected for each environmental issue identified.

When comparing the use of different data sources by government representatives and individual stakeholders, it is not surprising to find that the largest proportion of respondents used the Internet to source species and other environmental data. All stakeholder categories, except Tier 1, kept their own records of species and other environmental data, ranging from 10% of respondents in the “farming and rural business” category to 100% in the “hunting and recreational animals” category.

Investigation of the characteristics of the information used in local government (Tier 1 and 2) revealed that a substantial proportion of the data used was not available in a digital format and was not regularly updated. For example, only 69% of environmental data used by Tier 1 was stored on a computer and only 63% was regularly updated. Only 23% of data used by Tier 1 and 29% of data used by Tier 2 was considered by the interviewees to be spatially referenced. Comparison between countries of local level government reveals similar patterns (Figure 3.16).

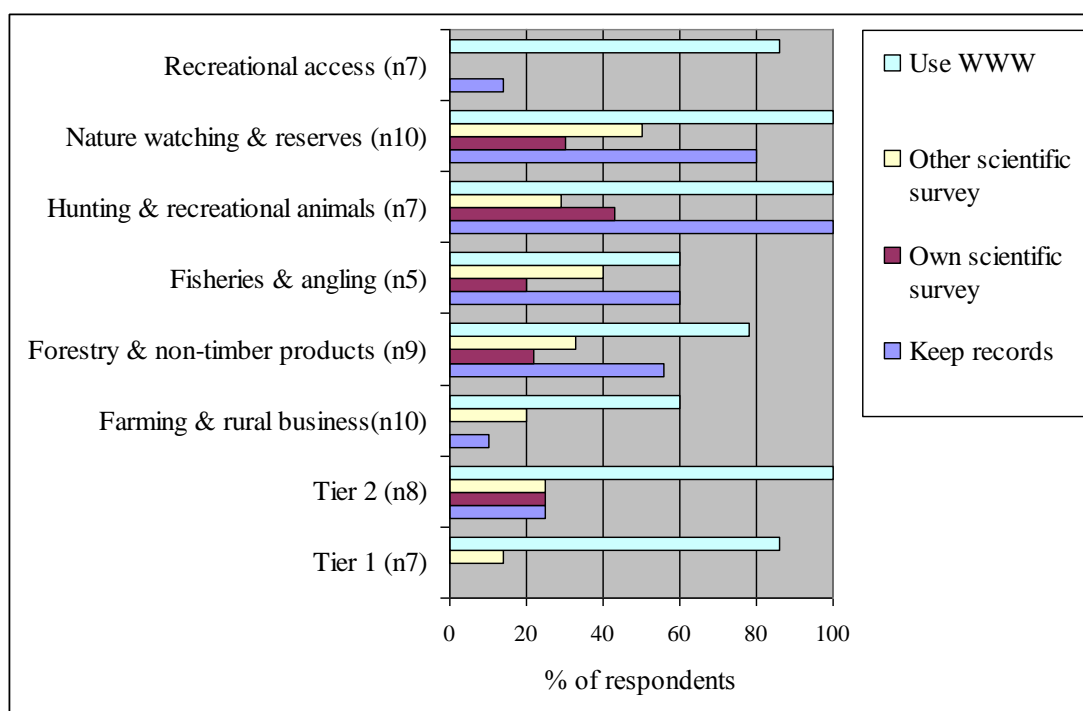


Figure 3.16. Comparative usage of different data sources. The proportion of interviewees in the government and stakeholder categories using species data or other environmental data and the source of those data.

The degree of availability of data in digital format or spatially referenced varied considerably between countries, and spatial referencing was particularly lacking in many countries (Figure 3.17). The case studies with highest proportion of data available in regularly updated digital format to their Tier 1 governments were Turkey (Firtina) and Portugal. Romania, Turkey Egidir and Greece reported the same for their Tier 2 government (Figure 3.17).

Although this may identify a need for data to be more accessible and available in a more user-friendly format, care should be taken in the interpretation of these results as the response rate was poor, with between many between 11% and 38% of non-responses to the questions on the accessibility of data in the interviews.

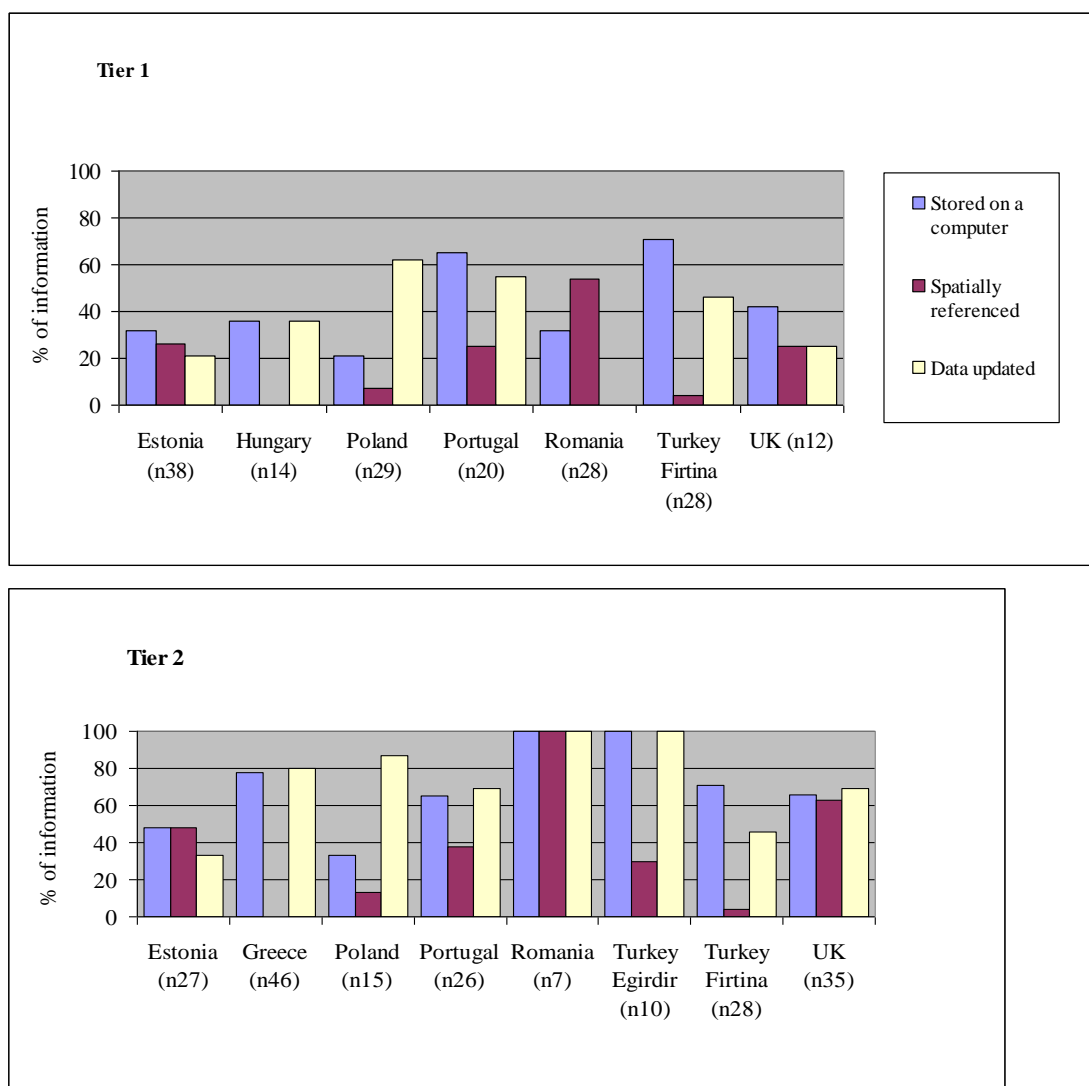


Figure 3.17. Proportion of accessible environmental information that is stored on a computer, updated and spatially referenced. Comparison between Tier 1 and Tier 2 local governments of TESS partner countries where n = the number of categories of required information.

3.4.8 Availability of required data

The survey asked interviewees whether they were able to obtain the environmental information that they needed. A substantial proportion of responses for both tiers of local government and for the individual stakeholders indicated that either “most” or “all of the required data was available. However, up to 15% of respondents indicated that “none” of the required information was available, highlighting a major obstacle to effective decision-making (Figure 3.18).

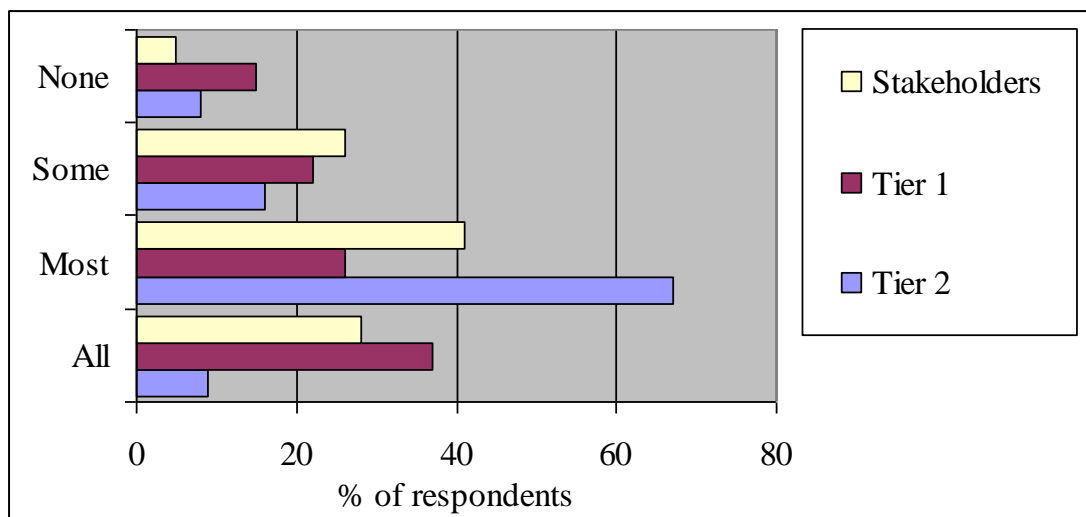


Figure 3.18. Proportion of stakeholder interviewees and government representatives that could access the required data for environmental decision-making. Possible responses regarding data availability were “none”, “some”, “most” or “all”.

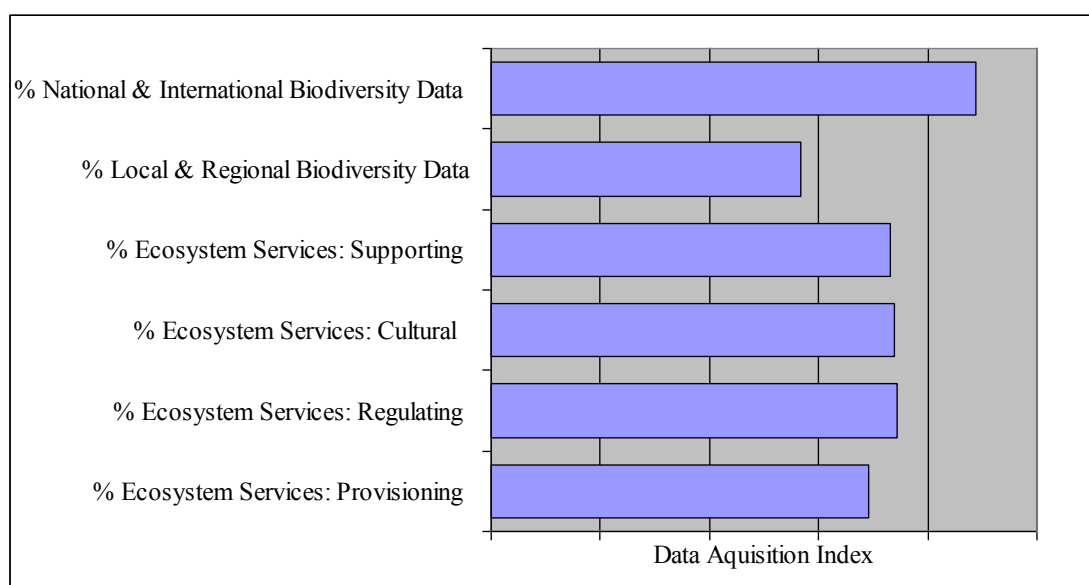
To investigate differences in accessibility for different types of information, the responses for all groups of stakeholders were grouped using a Data Acquisition Index (DA_q), which applied a ‘weight’ to each response depending on the degree of availability. Percentage, rather than sum of responses was used to avoid positive bias to those categories that were simply required more regardless of relative availability.

$$DAq_i = \% \text{ responses} \times \text{weight}_i$$

Where weight: None = 0, Some = 1, Most = 2, All = 3

When all responses were grouped, the DA_q Index revealed that local & regional biodiversity data was particularly lacking, whereas national and international data was the most easily acquired. Interestingly, information on the four broad categories of ecosystem services was perceived to be more readily available than local biodiversity data (Figure 3.19).

Figure 3.19. Accessibility of environmental information grouped according to Biodiversity and Ecosystem services using a Data Acquisition Index (DaQ). Responses are collated for tiers of local government & stakeholder groups.



There was some variation between countries, and stakeholder groups, in terms of the degree to which needs were met. Romania and the UK (except Tier 2) indicated that they were able to acquire a relatively high proportion of information required, whereas both tiers of local government in Estonia indicated relatively low acquisition. Interestingly the individual stakeholders in Estonia expressed very different views – showing a much higher satisfaction with information access. It is important to note that perception of the completeness of information to aid decision-making will depend on the demand for these data as well as their supply. Interviewees will have considerable differences in their concepts of the appropriate information needed to make an informed decision affecting their environment.

3.4.9 Barriers that impede access to adequate environmental information

All categories of stakeholders and both levels of local government encountered barriers that impeded access to adequate environmental information. Notably the groups with the greatest perceived *need* for environmental information (local government and nature watching and reserves - see section 3.4.2) also reported the greatest difficulty with obtaining the data that they required (Figure 3.20). This suggests that there may be a motivational effect with barriers only being encountered when effort is made to acquire the information. Forester interviewees lowest reported the least difficulty obtaining data perhaps reflecting the availability of certain types of information. This aspect would merit further clarification in future work.

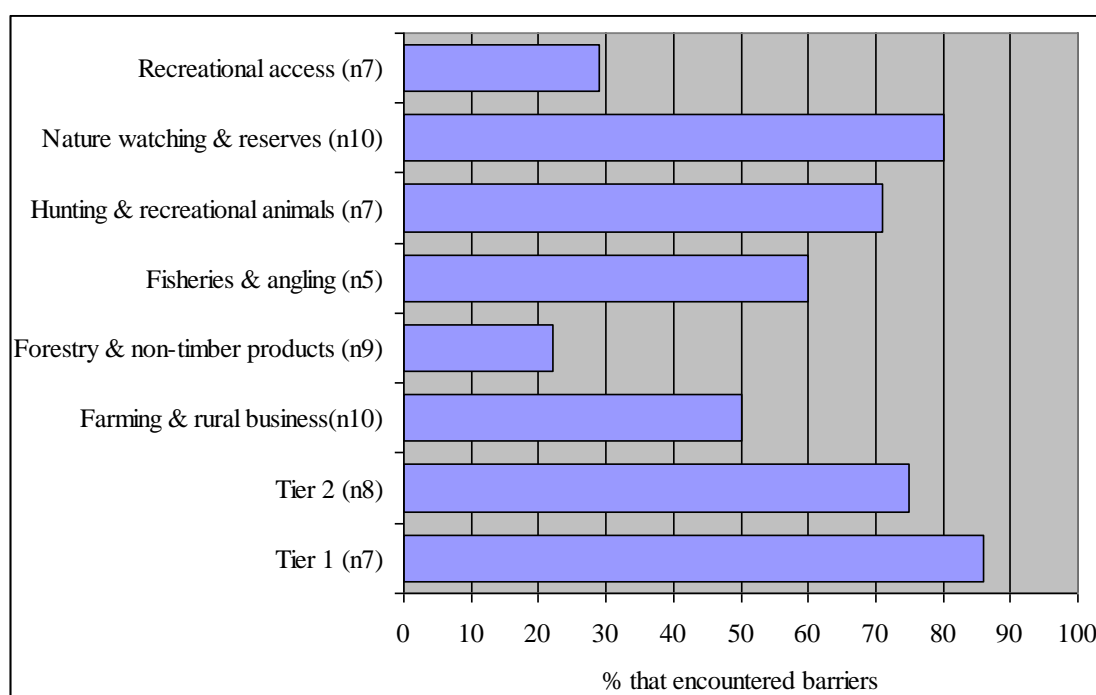


Figure 3.20. Proportion of stakeholder interviewees and government representatives encountering barriers that impeded access to adequate environmental information

Differences in the degrees of difficulty in obtaining suitable information were evident between countries. Hungary, Poland and the UK indicated the highest number of problems when obtaining data, experiencing up to 7 out of the 9 potential issues identified for both tiers of local government and 100% of the individual stakeholders in Greece and Poland encountered some barriers.

In contrast, none of the Romanian local government, or other stakeholder interviewees except for the representative of the “hunting & recreational animals” category, reported any impediments to information access; the Romanian category was an exception to this pattern. On average across countries, 52% of the individual stakeholders encountered barriers to prevent access to information (Figure 3.21).

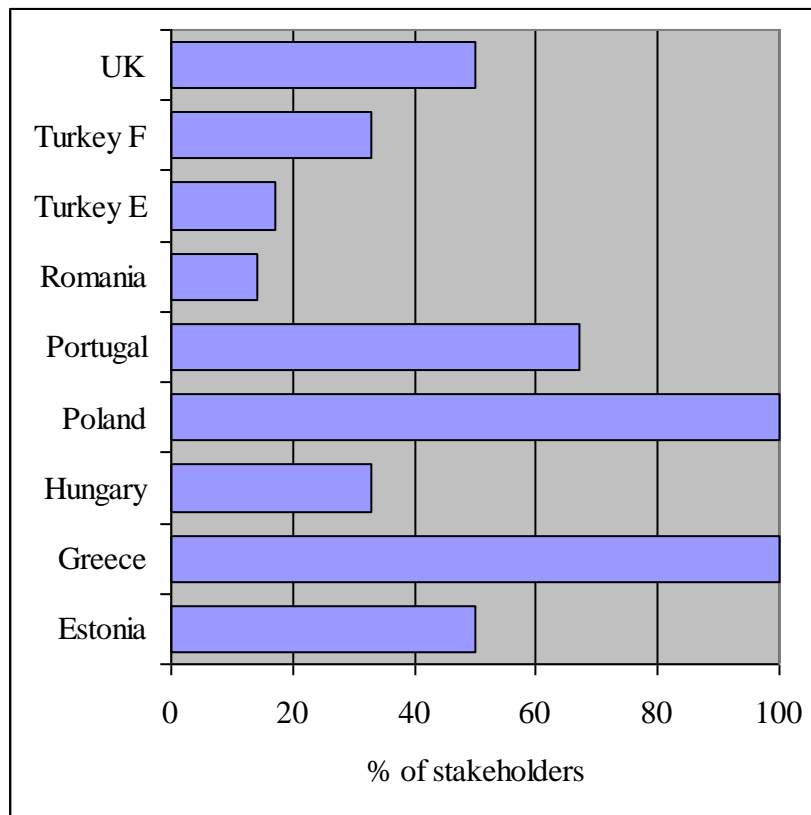


Figure 3.21. Proportion of individual stakeholders that encountered barriers to prevent access to adequate environmental information, grouped by country.

Difficulty in ‘finding the information’ was the category most commonly selected as the reason for difficulty in acquiring adequate information. However, each factor identified in the survey design as a potential barrier was encountered by most of the stakeholder groups, with accuracy, scale, access & age identified as the most important barriers. The factor that considered motivation of the interviewee, ‘not likely to make a difference’ was the least commonly selected (Figure 3.22). This suggests that there is an enthusiasm as well as a need for adequate information, which is currently thwarted, to some extent, by a number of barriers to acquisition, with difficulty in locating the information presenting the most frequent impediment.

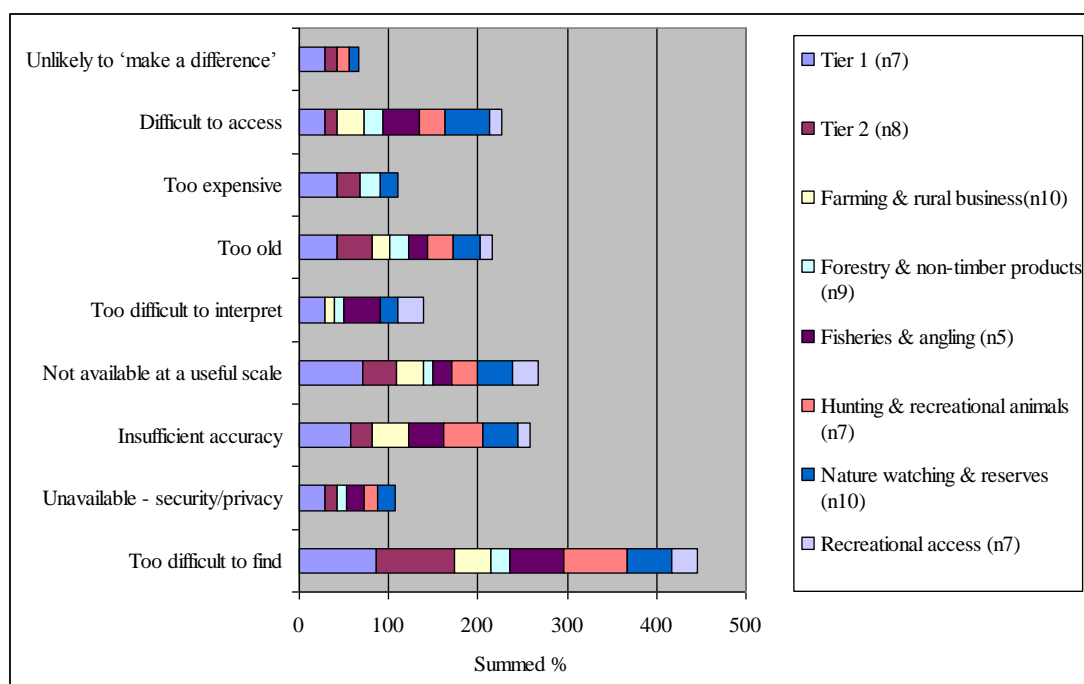


Figure 3.22. The proportion of interviewees for each stakeholder category and the proportion of government representatives in each partner country who indicated a factor that caused problems when obtaining data.

3.5 Summary and recommendations

In section 3.1.1, the aims of TESS Work Package 3 were condensed into five questions regarding the supply and demand of environmental information to local governments and selected groups of individual stakeholders.

These were:

- i. What are the information needs?
- ii. What determines the information needs?
- iii. What information is used?
- iv. What information is needed but currently unobtainable?
- v. What are the barriers to obtaining information?

An important caveat to interpretation of these results is that they represent a pilot stage in the TESS project leading to a much more extensive survey in TESS WP5. They are therefore based on a small sample of case studies and it is the range of responses that is generally of more interest than other statistics (such as averages) that would require a much larger sample.

3.5.1 What are the information needs?

The survey found that all groups of interviewees spent a substantial proportion of time considering environmental matters when making management decisions (Figure 3.4) although the greatest needs for environmental information were in government, nature-watching/reserve management and forestry (Figure 3.12, Table 10). The demand for environmental information varied between the groups of interviewees but almost all categories of information that were surveyed (biodiversity and ecosystem services) were required

(Figures 3.6 & 3.7), to some degree, by all categories of stakeholder (Figure 3.4). Notably information on heritage conservation was an exception. Information on physical hazards such as flood and fire risk, biodiversity and tourism capacity were key issues for local governments across the case studies. In particular, Tier 1 tended to put more priority and need more information on ecosystem services and socio-economic considerations generally than Tier 2, which was in turn more focussed on biodiversity issues than Tier 1 (Figures 3.1, 3.4, 3.6, 3.7, 3.12 and Table 3.10).

3.5.2 What determines the information needs

All of the possible 'drivers' that might determine information needs that were identified in the survey were rated as important factors by the interviewees from all sectors. These included a statutory requirement to inform management decisions, a need for information for local policy formulation and a need to inform management decisions (Figure 3.13). Despite recognition of the importance of statutory requirements in driving information needs; local government interviewees tended to report a fairly low level of direct involvement in EIA and, especially SEA processes. This was particularly notable in the most local level of government (Tier 1). Nevertheless, the relatively low requirement reported for specific data types to inform EIA that was reported by Tier 2 as well as Tier 1 (Figure 3.14) is a little surprising.

The number of decisions being made might also drive information needs. When viewed in terms of the area managed, it was evident that the individual stakeholders in the farming and rural business category reported more decisions annually than the other categories (Figure 3.3). Further work in this area would be required for more robust interpretation that allows comparability between decisions. In other words a decision to trim 50m of hedge by a one farmer is not equivalent to a decision to trim all the hedges in a large estate by another farmer, or indeed, a decision by a local government department to grant planning permission for a major development. If this approach is to be used in future surveys, the 'decisions' need clear and specific definition.

The extent of involvement in the decision making process may also influence perceived needs. The survey indicated a disparity in the perception of the participatory process between local government and individual stakeholders. The stakeholders generally felt that they had little involvement and influence, whereas the local government responses reflected a perception that the mechanisms for engagement with local communities were in place. If individuals do find it difficult to engage with local environmental decision-making processes, this perceived disenfranchisement is likely to reduce their demand for information.

3.5.3 What information is used?

A reliance on Internet sources of information was reported across all government & other stakeholder categories and in all of the case studies. In contrast, there was a limited use of local survey data and especially of information derived scientific survey (Figure 3.16). This raises the question of the quality and validity of information that may be being used to make decisions affecting environmental management right across the sample of case studies and should be noted as an important factor for emphasis in future work within TESS.

It was apparent that much of the information accessed by local governments was not stored on computers; even less was regularly updated or spatially referenced (i.e. mapped). Another point of interest, and importance for design of information

systems, was that although most information was needed by government, forestry and nature-watching/reserves (Figure 3.12, Table 3.10), four of the stakeholder groups (especially hunting and nature-watching/reserve-management) were at least as active as Tier 2 governments in generating their own environmental information, as demonstrated by the proportion of their information requirements that were met through their own survey and record keeping as (Figure 3.16).

3.5.4 What information is needed but currently unobtainable?

A substantial proportion of interviewees in all government and other stakeholder groups, and across all case studies, reported difficulties in obtaining adequate information for their decision-making purposes (Figure 3.20). Although biodiversity information at the National level (e.g. national figures for biodiversity and habitat) was relatively accessible, species and habitat data collated at the local & regional level appeared to be the most difficult category of information for interviewees to access (Figure 3.19).

Notably, the highest perception of these impediments to data access occurred in the stakeholder groups (local government & nature watching and reserves) that also indicated that greatest requirements for information (Figure 3.12), although foresters seemed to have adequate access. Perhaps the motivation of interviewees affected the likely perception of barriers. In other words, stakeholders who expressed little need for information were unlikely to encounter barriers to obtaining data.

3.5.5 What are the barriers to obtaining information?

Many potential barriers to obtaining adequate information were reported in the surveys and this occurred in all of the case study countries and all of the stakeholder groups (Figure 3.22). The most frequently cited problem was a difficulty in finding & accessing information. Other key issues encountered by the interviewees were the accuracy of the data, availability at an appropriate spatial scale, and the age of data.

3.6 Acknowledgements

Many thanks are due to the local government and individual stakeholder representatives from each of the participating case study areas who willingly gave their time to consider our nine-page survey forms. This work would not have been possible without their generous help. We are also extremely grateful for the care and effort contributed by our TESS partners who conducted the interviews and their patience during review and revision of the forms. These partners are listed below.

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