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2 Landscape Within The Framework Of Environmental Assessment At Project And Planning Levels

2.1 Introduction

Landscape (and visual) impact assessment (LIA) is an instrument used to identify and assess the significance and the effects of change resulting from development proposals on both the landscape, as an environmental resource and on people's views and visual amenity (LI and IEMA, 2013). As discussed in this chapter, when carried out LIA as part of an EIA or SEA, the interrelationships with other environment-related topics such as climate, fauna and flora, human beings, soil, noise, cultural heritage, air, water and others are also considered.

According to the LI and IEMA (2013, p.9), "*impact*" is the action being taken and *the effect* is a change resulting from that action; The EIA/SEA Directives put the emphasis on *likely significant effects* including all types of effects, for example positive/beneficial, negative/adverse, direct/indirect, long term/short term and cumulative effects (EC, 2001; EC, 2014).

LIA is an effective tool for the achievement of sustainable landscape development. Since it was first introduced, the scope of landscape impact assessment has broadened and diversified. This was in response to international calls for greater landscape protection (and management), and to the emergence of existing and new challenges, such as those relating to environmental health and climate change.

The link between landscape impact assessment and environmental health is widely acknowledged. According to Fredrickson (1998), positive emotions such as those that a landscape can generate, contribute to the mental and physical well-being of humans. They are stored in the "cache" memory of humans, and act as an antibody against negative emotions and poor health (Frederickson, 2001).

Landscape impact assessment should also take into account climate change, particularly in terms of the impacts that a proposed development is likely to have on both, mitigation and adaptation efforts (LI and EMA, 2013). The production of prediction models and landscape development scenarios (for example models presenting air quality change, air temperature change, hydrological regimes change, scope of dry areas) offer ideal outputs based on which it is possible to determine predicted landscape impacts within the overall framework of an environmental assessment. Assessing the forecasted effects of climate change on landscape, is important for both strategic and project level assessments.

2.2 Landscape Impact Assessment At Project Level Within The EIA Process

2.2.1 Environmental Impact Assessment – Concept, Implications And Wider Context

Environmental Impact Assessment (EIA) can be defined as a systematic process in which potential environmental impacts of a planned activity are considered. More in detail, it is a process for evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse, prior to a decision being made on whether or not the proposed project or development should be approved (CBD, 2017). There are a number of features that could be extracted from these definitions, which help further outline the nature and aims of EIA.

EIA is anticipatory, in that it needs to look into the potential consequences of project developments at the earlier stages of decision-making prior to a decision being made (Partidário, 1993). This contributes to making EIA a decision-making support tool, rather than a decision-making tool. Following notions of positivism and scientific rationality, it is assumed that EIA can support and assist in making better decisions, if the process is informed by objective data evaluated according to a systematic and structured procedure (Weston, 2004). As acknowledged by Weston (2004, p.315), “the language of rationalism and EIA is indistinguishable”, and EIA’s process mirrors that of rational planning processes (Lawrence, 2000; Elling, 2009). This entails collecting information about the affected environment, and using that information effectively so that the planned objectives can be met (Elling, 2009; Weston, 2010). This in turn, emphasises another feature, which is that EIA is objective. The rigour with which it is supposed to be conducted, and the evidence-basis on which evaluations are made have given EIA the status of a scientific tool which aims to enhance knowledge about the environmental effects of proposals (Owens and Cowell, 2002; Bartlett and Kurian, 1999) through the collection of both, qualitative and quantitative data. However, as argued by some, the scientific and objective nature of EIA can also be used to legitimise planned developments or decisions that have already been made (Bühr, 2009; Wood, 2003), or to mitigate negative effects rather than lead to the abandonment of certain proposals (Jay et al., 2007).

The objectivity of EIA, and the level of rigour with which the process should be conducted, requires that the data collected and the evaluations undertaken are summarised in a report describing the significance of likely impacts on the environment, and open to public scrutiny. This helps enhance the transparency of the process, and make EIA a participatory environmental management tool, which relies on and recognises, consultation and public participation, as an established step to carry out and a way of bringing communities into the process (Elling, 2009). Early and continuous communications between developers, statutory consultees, interest groups and members of the public with an interest in, or who might be affected

by a proposed development, can in effect enhance the evidence basis of an EIA by providing advice and information; and assist in the evaluation of potential impacts, by providing local knowledge or values and perceptions that help to identify features valued by communities (Shepherd and Bowler, 1997). The importance of involving the public in environment policy- and decision-making is widely acknowledged, as reflected in numerous legal EIA requirements of different countries or international conventions, such as the Aarhus Convention, who recognise EIA as being instrumental for providing access to justice, and for empowering public rights to information and greater democracy in decision-making (Gonzalez et al., 2008; Creighton, 2005). However, as noted by Shepherd and Bowler (1997), public participation can make EIA costly and time-consuming, sometimes resulting in public involvements and consultations being conducted as a mere procedural exercise, still today (Morgan, 2012).

EIA is also considered an advocate tool for (the protection of) the environment, as one of its aims, or “proximate aims” as noted by Jay et al. (2007), is to identify environmental impacts and take them into consideration in decision-making (Cashmore et al., 2004). While it cannot be assumed that the resulting decision will be more environmentally-friendly, it is believed that by systematically assessing environmental information, a process of learning will take place and attitudes towards the environment will improve (Jha-Thakur et al., 2009; Jay et al., 2007; Cashmore et al., 2004; Weston, 2010). However, as EIA does not require decision-makers to give any weighting to the environmental information taken into account, political considerations or weightings often prevail (Jay et al., 2007), making EIA’s claim of being an advocate tool for the environment rather weak (Benson, 2003; Owens and Cowell, 2002; Wood, 2003).

More recently, EIA is being perceived as a tool that can help design and plan more sustainable forms of development (Glasson et al., 2005). Its approach to the environment, which includes socio-economic, cultural and human-health impacts; the focus on impacts, including cumulative ones; and its participative nature requiring local views and knowledge, can help facilitate both, intragenerational and intergenerational equity (Lee and George, 2000; Bruhn-Tisk and Eklund, 2002). However, the extent to which this is actually happening is debateable with the environmental focus in EIA still dominating the way in which this decision-making support tool is perceived (Cashmore et al., 2004; Jay et al., 2007).

EIA is mandatory and formalised. Since it was first instituted in the United States via the National Environmental Policy Act of 1969 (NEPA), EIA has been introduced in legislative frameworks around the world (Wood, 2003), with many countries, international organisations and banks developing their own EIA systems (Lee and George, 2000), incorporating formal procedures into either planning or other areas of environmental decision-making. The formalisation of EIA has progressed and been consistent over the years, and EIA is now “recognised in international conventions, protocols and agreements, including the Convention on

Transboundary Environmental Impact Assessment; the Convention on Wetlands of International Importance; the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters; the United Nations Framework Convention on Climate Change; the United Nations Convention on the Law of the Sea; the Protocol on Environmental Protection to the Antarctic Treaty.” (Morgan, 2012, p.6). As noted by Morgan (2012) a search carried out in 2011 found that 191 of the 193 members of the United Nations either had EIA legislation or references to EIA, or to an equivalent process in their legislation. EIA’s strong legislative basis has therefore contributed to making it one of the most, if not universally and formally, recognised and practiced assessment tools for achieving environmental protection and solving environmental problems (Jay et al., 2007; Morgan, 2012).

The main features and aims of EIA presented so far, including the EIA report or Environmental Statement summarising the findings of the assessment, can be applicable to other forms of impact assessment and to different levels of decision-making. Yet, in most jurisdictions, EIA is commonly understood to apply to the project level, which refers to concrete development projects. Within the EU context, Article 1(2) of the EIA Directive defines “project” as: “the execution of construction works or of other installations or schemes, other interventions in the natural surroundings and landscape including those involving the extraction of mineral resources.” Further, the Directive specifies the project categories for which developments ought to be subjected to an EIA, which are listed in Annex I and II (see Directives 2011/92/EU and 2014/52/EU). However, a review of the effectiveness of the application of the EIA Directive in EU member states revealed that in practice it can be difficult to establish whether an individual project fits a project category and should be subjected to an EIA or not. A number of court cases have prompted the EU to issue further guidance to assist with the interpretation of definitions of project categories of Annex I and II and provide key principles clarifying the purpose of the Directive deriving from case law of the Court (EC, 2015). To a certain extent, the academic literature has also attempted to grasp what a project is, and how it compares to a policy, plan or programme. As indicated by Wood and Dejeddour (1992), the meanings of these different levels of impact assessment application vary considerably, with some countries calling “policies” “plans” and other countries referring to “plans” as “policies”. Within the context of an iterative forward planning process, which starts with the formulation of policies at the upper level, followed by plans, programmes and projects, they consider a policy “as the inspiration and guidance for action, a plan as a set of co-ordinated and timed objectives for implementing the policy, and a program as a set of projects in a particular area” (ibid., p.8). Within this framework, projects refers therefore to the definition of actual developments.

Following this introduction, the next two sections explore EIA in more detail, looking particularly at the consideration of landscape in EIA and at the procedural steps for carrying out landscape impact assessment in EIA.

2.2.2 Application Of Landscape Impact Assessment Within EIA

Since EIA first came to the fore in the 1970s, other forms of impact assessment have been introduced, often in response to different needs (Petts, 1999a) or, as argued by Morgan (2012) to address weaknesses arising from EIA practice. Under the umbrella term of EIA, specific forms of impact assessment are becoming increasingly established. Among many others, these include: Social Impact Assessment (SIA), which evaluates the impacts of a proposed development on humans and on the ways in which “people and communities interact with their socio-cultural, economic and biophysical surroundings” (IAIA, 2017); Health Impact Assessment (HIA), which the World Health Organisations defines as “a means of assessing the health impacts of policies, plans and projects in diverse economic sectors using quantitative, qualitative and participatory techniques” (WHO, 2017); or Strategic Environmental Assessment (SEA), which evaluates the impacts of a proposed policy on the environment. Its strategic nature is what makes SEA distinct from EIA, which as previously suggested, focuses on assessing the environmental impacts of development proposals at the project level. SEA and the consideration of landscape in SEA will be explored in more detail later in this chapter. There are also forms of impact assessment that focus on specific environmental receptors, for example, Water Impact Assessment (WIA), Ecological Impact Assessment or Landscape and Visual Impact Assessment. The latter is subsequently explored more in detail.

Landscape has long been considered in EIA and/or in land use planning. As summarised by Knight (2009), assessments conducted up to the 1980s generally focussed on the designation of areas of landscape quality, prompting the areas non-designated to be pursued by developers. In the 1980s landscape assessments focused on identifying what makes one landscape distinct from another, setting the foundations for the concept of landscape character, now central to landscape assessments, and a change of “emphasis from landscape as ‘scenery’ to landscape as ‘environment’” (ibid., p.123). While conventional EIA practice has been often based on the assumption “that landscape issues are passive mitigation, to be added after project design”; there is also growing recognition that a more positive approach to EIA is needed, thus one that considers landscape and visual effects as essential to project design for which impacts should be avoided, rather than “simply” mitigated (Hankinson, 1999, p.347). Ratifications of the European Landscape Convention are expected to enhance the consideration of landscape in EIA, at the very least, by providing a definition of landscape (Antonson, 2011). However, some scholars have raised criticisms about the way in which landscape is considered in EIA. Wood (2008) for example, raises questions about the use of, and lack of consistency in, expert judgements in EIA when determining the significance of landscape impacts, describing it as “an opaque or black box exercise” (p. 25). However, it is also worth noting that landscape considerations are probably the most subjective of impacts typically considered in an EIA, which presents added challenges as well as the need

for qualitative approaches (Morris and Thérivel, 2009; Knight, 2009). Hankinson (1999) emphasises common technical problems, which include the excessive reliance on computer generated outputs, problems relating to access and timescale, and the resistance to accept that not all changes to landscape are negative. Further, Bond et al. (2004) note how in EU practice there has been limited consideration of cultural heritage in EIA, often restricted to the consideration of the built heritage, and excluding the consideration of cultural values, including those associated with landscape. When reflecting on the consideration of landscape in the Swedish EIA process, Antonson (2011) concludes that knowledge of landscape according to the terms of the European Landscape Convention appears to be limited in EIA practice and among the participants to the EIA process, including EIA professionals.

The consideration of landscape in EIA is required in a number of legal systems. For instance, the European Union EIA Directives require that the impacts of a project on the population and human health, and on material assets, cultural heritage and the landscape, and on the interrelationship between all these aspects, should be identified, described and assessed (art 3, Directive 2014/52/EU, EC, 2014). This therefore includes the consideration of both, direct and indirect effects of a project on physical and human features, as well as the consideration of effects on landscape, including inherent changes in landscape character, regardless of whether visual effects take place (Hankinson, 1999). Fulfilling and complying with this requirement is a core part of the EIA process for member states of the European Union and for many developed countries. In addition to EIA legislation, practice of project-level landscape EIA is also supported by legislation which usually relates to landscape quality designations. For instance, internationally, the European Landscape Convention provides a framework for legislation for addressing landscape issues in the ratifying countries. Nationally, in the UK for example, the 1949 *National Parks and Access to the Countryside Act* designates National Parks as well as Areas of Outstanding Natural Beauty (AONB) in England and Wales with equivalent legislation in Scotland (*the National Parks (Scotland) Act*). Other relevant legislation can be associated with planning rather than landscape designations, e.g. greenbelts in the UK. Neither the EU Directives nor international or national legislation prescribe a methodology for how landscape effects should be assessed in EIA (Wood, 2008). International guidelines are also not available, hindering the development of good practice particularly in developing countries (Tahsildar and Flannery, 2012). Numerous guidelines have however been produced, with the joint effort of the UK's Landscape Institute (LI) and Institute of Environmental Management and Assessment (IEMA) being one of the most well-known and cited, possibly justified by the extent to which project level landscape impact assessment is widely practiced in the UK (ibid). The *Guidelines for Landscape and Visual Impact Assessment* (GLVIA3) published in 2013 is at its third edition, with the latest edition set within the context of the European Landscape Convention and including an increased emphasis on green infrastructure, ecosystem services, and developments in landscape character assessments, seascape character assessments,

and historic landscape characterisations. As stated in the guidelines, landscape and visual impact assessment (LVIA) can be conducted either formally as part of an EIA, or informally as part of a development proposal or planning application, though the core approach is similar in both cases (LI and IEMA, 2013). In the first case, the LVIA is carried out as a separate theme, and covered in the Environmental Statement or Report. In the second case, the approach is more informal and flexible, though the key stages of an LVIA still apply. A flow chart representing the EIA and LVIA process is provided in Figure 2.1.

Figure 2.1: The EIA and the LVIA process. Adapted from LI and IEMA (2013, p.29).

The participative nature of EIA and the European Landscape Convention's strong emphasis on seeking opportunities for public participation (Antonson, 2011), strengthen the definition of landscape as a cultural and social construct, which include the consideration of aesthetic and perceptual factors, as well as natural, social and cultural factors (Knight, 2009). The requirement to include in the assessment the effects of a potential development proposal on the interrelationship between people and place means that landscape cannot be a matter for experts only. Individual and community experiences of, and relationships to, landscapes are also important, and should feed into EIA processes. According to Antonson (2011), the public's values and views should be weighed on par with expert views. Landscape value could

be recognised by experts through landscape designations, either via planning or environmental legislation, but it could also be valued by people for its tranquillity, wilderness, for its cultural associations, for conservation issues or other perceptual aspects, thus, without an official designation status needing to be in place. The public also holds local landscape knowledge which could be beneficial to both, project design and to the EIA process itself, which further supports Antonson's view. Other interest groups who should be involved in the process are the regulatory/competent authority, for example the local planning authority and its landscape officers; statutory consultees, thus those organisations who must be consulted according to the law; non-statutory consultees, thus other interest groups which might include conservation bodies or residents who should be consulted because they might either have an interest in, or be affected by the potential development proposal.

2.2.3 Landscape Impact Assessment Procedure Within Environmental Impact Assessment in Selected European Countries

As mentioned in the previous section, under the overarching tool of EIA, different forms of impact assessment have developed, such as landscape impact assessment undertaken within a conventional EIA process. As such, the process follows the well-known steps of EIA (see Fig. 2.1), and adopts similar methodologies and terminologies. Within the context of the EU Directives, following Morris and Thérivel (2009) and Hankinson (1999), these procedural steps normally include:

Screening: it is a very early and essential step in an EIA procedure, which aims to determine whether an EIA is required or not. It entails a preliminary assessment which normally seeks to answer two questions: (a) whether the proposed development will impact the environment; including the consideration of landscape change and visual impacts; and (b) whether the potential impacts are likely to be significant. If the answer to the second question is yes, then an EIA is required and the proposed development must be formally subjected to an EIA. If the answer is no, then an EIA is not required. Within the EU, the EIA Directives identify the projects for which an EIA is essential, and those for which an EIA might be required through case-by-case decisions based on three criterion: (1) characteristics of a project; (2) location of a project, and the environmental sensitivities of the area (including landscape rarities and areas of particular historical, cultural or archaeological value or designated to be of interest under legislation); and (3) characteristics of the potential impacts determined in relation to the first two criterion.

Scoping: the aim of this step is to identify the key receptors, impacts and project alternatives to consider, the methodologies to apply, and who should take part in the consultation process. Normally conducted at the early stages of project design, the findings of this step are then summarised in a scoping report, made available to all participants to the EIA process. In relation to landscape, this step determines

whether there is a need for a landscape and/or visual impact assessment, or not. If it is required, then the scope of the landscape and/or visual impact assessment needs to be defined. Issues likely to contribute to defining the scope of the landscape and visual assessment include: (a) a description about the proposed site and of its surrounding landscape; (b) a description of the proposed development; (c) an initial draft of the issues to cover in the baseline studies; (d) the alternatives considered; (e) the impacts pre-determined during the screening process; (f) the proposed assessment methodology and (g) mitigation measures.

Baseline studies: they concern the description and evaluation of the baseline conditions of the area likely to be impacted by a proposed project. It constitutes the evidence-basis of the assessment, and includes socio-economic, environmental and any other relevant information concerning the likely impact area, some of which might be available or might need to be collected through site visits or field work. The findings of this step should not only outline limitations of the baseline study conducted, for example in relation to data accessibility or accuracy, but also provide an initial assessment of the value of key receptors and their sensitivity to impacts. In relation to landscape, different methods can be used to collect the baseline data in support of the landscape and/or visual assessment. These might include a landscape character assessment (see Box 2.1), desktop studies based on available and accessible published data (e.g. geology and soil maps, ordinance surveys, aerial photographs, existing policy, plans and legislation which set out designations of different types and land uses/covers/forms, but also literature, paintings or historical data to determine associations of a cultural value); and field studies, including site and landscape surveys, with photographic records, sketches, and survey sheets. Visual assessments in particular often make use of computer-aided systems to explore the impact significance of a proposed development from different viewpoints and generate a zone of theoretical visibility (i.e. definition of the area with potential visual implications).

Impact prediction and assessment is the step in which the potential impacts of a proposed project on the environment are taken into account, including those on landscape. The impacts could be of different types, direct or primary, indirect or secondary, cumulative and synergistic, thus resulting from impact interactions. In addition, impacts can be positive or beneficial; negative or adverse; short, medium or long-term; reversible or irreversible; and permanent or temporary. The severity of impacts is defined in terms of magnitude, and both, qualitative and quantitative methods can be used to establish impact magnitudes. The approach set out in the UK's guidelines for LVIA (LI and IEMA, 2002) is summarised in table 2.1. During this step, the significance of impacts is also determined, which is an assessment of an impact's magnitude in relation to the value, sensitivity or recoverability of the (environmental) receptor impacted determined during the baseline studies step. In relation to landscape, the assessment stage will focus on establishing the potential impacts of a development activity on: (a) the site's and local landscape's character; (b) the extent to which the landscape is able to cope with the implementation of

the proposed development and the changes resulting from it; and (c) on the local communities and existing developments on the site and surrounding area. In relation to visual assessment, this step explores: (a) theoretical and potential visibilities; (b) the views impacted and the viewers affected; (c) the degree of visual intrusion or obstruction; (d) distance of the views, and (e) impacts on the character and quality of the view. This process is represented in Figure 2.2.

Table 2.1: Definitions of landscape and visual impact magnitudes. Aadapted from Knight (2009, p.135-136, originally in LI and IEMA, 2002).

Impact magnitude	Definition of landscape components/ character	Definition of visual impact
High	An evident change in landscape components, character and quality of landscape	The development has a defining influence on the view and becomes a key focus of the view
Medium	Discernible but not obvious changes to landscape components, character and quality of landscape	The development is clearly visible in the view and forms an important but not defining element of the view
Low	Minor changes in components, character and quality of landscape	The development is visible, but forms a minor element of the view
No changes	No changes in landscape components, character and quality of landscape	The development is not visible

Mitigation, specifically the identification of those measures that can help avoid, reduce, remedy or even compensate significant adverse effects of predicted negative impacts, including those of the main alternatives considered, resulting from a proposed project. Different measures will be needed to mitigate the effects of the adverse impacts on environmental components and receptors. When identifying mitigation measures it is good practice to apply the precautionary principle, meaning that measures should be in place even in the absence of strong evidence confirming that a negative impact will occur. In addition to mitigating impacts, good practice also recommends that opportunities for enhancing the environment, including an improvement in environmental conditions or features should be sought, emphasising the advocative nature of EIA previously discussed. As argued by Hankinson (1999), most landscape impacts could be avoided or reduced in significance by amending the project design; this would entail that the consideration of landscape be an integral part of project design through an initial landscape assessment, resulting in a more positive approach to project design. This is in contrast to looking at mitigation as a problem to solve or moderate (ibid) through an EIA based approach conducted after the project design stage, yet before the approval stage.

Figure 2.2: Assessing the significance of landscape impacts. Adapted from LI and IEMA (2013,p.39,71) and Knight (2009, p.139).

Monitoring: within the context of landscape EIA, the monitoring of landscape and visual impacts has had limited practice to date. This is because unlike other receptors or thematic issues like noise, water or air quality, landscape quality cannot be monitored on a quantitative basis. Where practiced, monitoring has typically consisted of a process of quality control, ensuring that development proposals have been implemented as approved, and that the impacts have not been more significant than what was reported in an Environmental report or statement. Local residents might practice informal monitoring, particularly if the visual impacts associated with the implementation of a project are greater than expected or what they had initially deemed acceptable. Though not originally required by the EU Directive, the newly amended EIA Directive (2014/52/EU) (entered into force on 15 May 2014 to simplify the rules for assessing the potential effects of projects on the environment), now formally requires developers to take the necessary measures to avoid, prevent or reduce the occurrence of adverse effects. The monitoring procedure is to be established by individual EU member states. The deadline for transposing the rules introduced by the latest amendment to the EIA Directive, including monitoring requirements, was May 16, 2017.

Environmental Statement: it is not a procedural step as such, but an output of an EIA process. It is a report or Environmental Report which summarises the EIA findings and proposals. It should include a non-technical summary so that the report can be fully understood by non-experts and subjected to public scrutiny. Where a landscape and visual impact assessment is conducted as part of, and within an EIA, the findings of the LVIA normally appear as either separate or combined sections of the environmental statement or report. If the LVIA was conducted as a standalone exercise, then the findings are normally presented as a separate report in support of a planning or project application. Whether produced as part of an environmental statement or as a standalone report, the findings of the LVIA should be presented in a manner to facilitate widest dissemination, legibility, and accessibility, making cross-referencing of files, documents and tables easy to understand and follow.

In most EU member states landscape-based EIA tend to follow the procedural approach outlined by the European EIA Directives, with wording in EIA legislation often mirroring the wording of the EU Directives. What might distinguish European practices is the way in which landscape is understood in more conceptual terms; thus, as a result of different countries' planning traditions and cultural approaches to landscape, which go beyond procedural aspects and predate the EIA Directives and the European Landscape Convention, as briefly illustrated in the following examples.

The UK, for example, has a long tradition of taking into account landscape considerations that goes back to Victorian times, with the creation of botanical gardens, urban parks, architectural gardens and landscapes. Since then, the way in which landscape is understood in the UK has evolved to reflect "the relationship between people and place, providing the setting for our day-to-day lives" (Knight, 2001, p.121). In more detail, in England, the UK's Department for the Environment,

Food and Rural Affairs (DEFRA) and Natural England emphasise the unique combination of elements and features that determine the way in which landscape is perceived, experienced and valued by people. These elements and features include “topographic features, flora and fauna, land use, sights, sounds, touch and smells, cultural associations, history and memories” (Natural England and Defra, 2014). In Scotland, Scotland National Heritage (SNH) defines landscape as “more than just the view”. They go on to suggest that it is about how people relate “to places and to nature - what they value about it, and how they respond to changes in the landscape” (SNH, 2015). The timeless and unique features or characters of a landscape aptly expressed over centuries through the works of poets, writers and painters (Tudor, 2014), have been particularly appreciated in the UK and resulted in the development of numerous studies exploring what gives a landscape its unique character. In England, these studies started in the 1980s; they set the foundations for the “countryside character programme” of the early 1990s and evolved into a guide to best practice approach, namely “Landscape Character Assessment: Guidance for England and Scotland” (2002). This approach is now widely adopted across the UK’s nations, and further afield (e.g. Keun-Ho and Pauleit, 2007; Jellema et al., 2008). It is further explained in Box 2.1.

Italy is another EU country that has a long lasting tradition of addressing landscape, though from a different starting point than other countries. Just like in other countries, “landscape” as a term which can encompass different meanings, is still evolving. Instruments for “controlling” or preserving the integrity of landscapes were introduced in Italy as early as 1909 and 1939, with laws on natural beauty aimed at safeguarding in particular national landscape heritage, and laws aimed at protecting elements of landscape that present artistic, historical, archeological or ethnographic value, including villas, parks and gardens. The development of regional landscape plans was then made compulsory in 1985. The need to protect the natural beauty of landscapes is also strongly reflected in the Italian constitution (Ventura, 2008), and still today, though a more modern and sophisticated understanding of landscape that appreciates its complexities exists, a protectionist approach aimed at safeguarding built and natural landscapes in the public and national interests remains. With the 2000 European Landscape Convention, landscape plans in Italy have further evolved to account for issues of identity and for public perceptions of landscapes (De Montis, 2016), with the principles of the European Landscape Convention being transposed into the country’s codes for cultural and landscape assets (*Codice dei Beni Culturali e del Paesaggio*) (Legislative Decree n.42, January 22nd, 2004) or urban codes (*Codici Urbani*). Today, the urban codes portray landscape as an expression of territorial identity, which is the result of natural and man-made actions and interactions. The codes go on to legislate that it is those aspects and characters that constitute material and visible representations of cultural value that should be protected as expressions of national identity. The aim of landscape protection should be to recognise, safeguard and where necessary, recover those cultural values that landscapes express through

a process of valorisation of both, areas that need requalifying because degraded or compromised, and new areas of landscape value which should be sought and established in a coherent and integrated way (Legislative Decree n. 4246, January 22, 2004).

Box 2.1: Landscape Character Assessment in the UK.

It is widely acknowledged that landscapes vary. They are more than just a visual image, which could be perceived by different people in different ways. Landscapes are history; they are the result of different physical and socioeconomic considerations, including their geology, soils, topography, land cover, hydrology, nutrient cycles, carbon fluxes, climate, customary laws, economic activities and cultural developments (Selman, 2012; Tudor, 2014). It is the interrelationship between each of these considerations that determines a landscape's character, making it distinct from any other landscape. Subsequently, a Landscape Character Assessment (LCA) is "the process of identifying and describing variation in the character of the landscape. It seeks to identify and explain the unique combination of elements and features (characteristics) that make landscapes distinctive" (Tudor, 2014, p.8), and for monitoring and managing changes in landscapes providing the basis for informed value judgements and decision-making. Consequently, it is essential that both, communities of place, of practice and communities of interest, are involved and engaged in a LCA process. As a process, LCA is increasingly used to inform the planning of natural, rural and urban areas, and more recently, its scope of application is extending to coastal and marine areas, with the development of Seascape Character Assessments (SCA) (Natural England and Defra, 2014). Both LCA and SCA consist of a four stage process (Natural England and Defra, 2014; Tudor, 2014; The countryside commission and Scottish Natural Heritage, 2002):

1. Define the purpose and scope of the assessment, thus, the area it will cover, the scale at which it will be carried out, the levels of detail, resources required (including skill sets), stakeholder engagement etc.,
2. Conduct a desk-study, thus, collect and review relevant background documents, spatial data, and other forms of information, such speaking to stakeholders and communities involved with the landscape,
3. Conduct a field survey, thus, to test the findings of the previous stage and draft areas of common character to develop an understanding of the landscape's aesthetic, perceptual and experiential qualities, and
4. Classification and description, thus classify, map and describe the landscape's character areas, types and characteristics. This stage will have been informed by the previous two stages and by stakeholder engagement exercises.

Once completed, the LCA will provide a document detailing the character of a landscape and an annotated map showing the character areas or types. It will most likely be complemented by photos, illustrations, diagrams and other survey data collected, enhancing its value as a decision-making support tool that can provide robust evidence for the baseline studies step of an EIA, linked to place and to those characteristics that contribute to creating a sense of place.

As suggested by the Italian example, signing and ratifying the European Landscape Convention is helping to align European countries' understandings of landscape, with many countries opting to follow the ELC's definition in the absence of national legislation. In Sweden, for example, the definition of landscape is increasingly shifting towards an understanding that appreciates landscape also as a social

construct, and recognising the need for public participation. The official definition of landscape in Swedish road planning is now one that encompasses “both natural and human features, experience, identity and character (Antonson, 2011, p.195), with landscape “no longer a matter solely for experts” (ibid.). This process of bringing existing legislation and guidelines in line with the ELC is still ongoing, and is bound to make every day practice of EIA difficult, due to inconsistencies in terminologies and references to different concepts, or understandings of landscape. It is only when the ratification processes will be complete across EU Member States, that the implications for EIA practice will become clearer. It might well be that the final outcome of this process results in the aligning of definitions of landscape and of principles for landscape protection and management informing EIA practices across ratifying countries, in the same way that the EU EIA Directives standardised (to a certain extent) EIA procedures.

2.3 Landscape Impact Assessment And Land Use Planning Within The SEA Process

2.3.1 Land Use Planning⁷

Land use planning can be defined as an interdisciplinary and comprehensive approach aimed at balancing regional development and the physical coordination of space, based on an overall strategy. It gives geographical expression to the economic, social, cultural and ecological policies of society (*Council of Europe, European Regional/Spatial/land use planning Charter, CoE 1983*). Or put more simply, land use planning can be defined as the management and development of space to create places that meet the needs of society, of the economy and of the environment in the quest for sustainable development. It relies on methods that are largely used in the public sector to influence the future distribution and rational organisation of development activities (EU Compendium of Spatial/land use planning Systems and Policies, CEC, 1997).

In many countries land-use planning represents a continuous and systematic activity which covers complex issues of spatial development at the zonal, local, regional and national levels throughout various procedural stages, including inventories, analyses, planning, decision-making and monitoring. It follows

⁷ due to the very large extent of this topic the authors do not consider land use planning instruments within the context of other planning framework and their supporting instruments such as strategic planning, spatial planning, communicative planning or rational planning. This subchapter analysis is focused just on land use planning in relation to both landscape planning and landscape impact assessment.

organisational rules, as well as the physical and temporal co-ordination of buildings and of other activities influencing the development of the area. Furthermore, it is intended to be inclusive and informed by the public. As such, land use planning can be considered an instrument for sustainable development, as it not only ensures that spatial conditions are met, but it also aims to ensure access to social and technical infrastructure, good quality of environment and guarantee the prioritisation of social goals, based on the views of the wider public.

Land use planning is normally practiced following the principles of subsidiarity and planning sovereignty of the basic spatial planning units, which tends to be municipalities or local planning authorities. This requires co-ordination of various interests among different decision-making tiers (e.g. between the municipality and the region), but also between economic (water management, agriculture, transport and others), public services (health care, social welfare, education, trade) and the private (including business for profit and non-profit) sectors, and individual citizens.

Land use planning creates conditions for effective public and private investments, influencing public spending to ensure equal access to education, social and technical infrastructure, employment opportunities and suitable housing as basic precondition of social equity.

The actual planning tool of land use planning consists of planning documentation usually represented by national spatial development strategies, regional plans, local plans and zoning plans. The value system of a society is projected into the legally defined priorities and objectives embedded in planning documentation, which is then subjected to approval. Planning approval of the plan is normally a decision made by the competent planning authority and has legal effect. According to the principle of subsidiarity, planning approval, including its objectives, is conditional to the plan's accordance and compliance with objectives, rights or principles guaranteed by the state. Often, national governments act as guarantor of the public interest, and can overrule the planning sovereignty of municipalities and or other planning subjects.

The practice of land use planning varies considerably, but usually include the following four stages (Wood, 1992):

- a) formulation of goals and objectives,
- b) survey, prediction and analysis,
- c) generation and evaluation of alternative plans, and
- d) decision, implementation, monitoring .

Land use planning is in many countries closely coordinated *with landscape planning*. Linkages between land use planning and landscape planning differs from country to country, as illustrated in Table 2.2. The range of possible approaches go from landscape planning as an optimising method of spatial arrangement of landscape based on the respect of landscape ecological conditions; to landscape planning approaches that focus mainly on landscape character and landscape scenery; to landscape planning

Table 2.2: Linkages between land use planning and landscape planning in selected countries. Source: Belčáková (2013).

Country	Planning level	Landscape planning	Land use planning	Scale of maps
Germany	State (Land)	Landscape development programme (nature conservation and environmental principles, land wide focal points of conservation and development)	Land development plan (Economic and social principles, land-wide focal points of spatial development)	1:500 000 to 1:200 000
		Landscape framework plan (regional environmental quality standards, regional environmental focal points of conservation, development and redevelopment)	Regional plan (regional economic and social objectives, regional focal points of development – development axes, central sites, etc.)	
	Region	Landscape plan (communal nature conservation and environmental objectives and measures, contribution to an environmentally sound land use development)	Land use plan (Urban master plan) (communal nature conservation and environmental objectives and measures, contribution to an environmentally sound land use development)	1:10 000 to 1:5000
	Town/community	Open space structure plan (zoning conception, ecological design of sites and buildings, ascertainment of compensation measures)	Local development plan (local development concept in terms of technical, construction, financial aspects, etc.)	1:2 500 to 1:1000
Austria	Federal	Not required	Austrian spatial development concept (Strategic policy document general orientation/vision)	1:500 000 to 1:200 000
		Not required	State development plans	

Country	Planning level	Landscape planning	Land use planning	Scale of maps
Czech Republic	Supra - local	Landscape framework plan (displays supralocal requirements, concepts and measures in the context of cultural landscapes)	Regional development plans (State development plans and regional development plans have the status of decrees, regional development plans are binding for spatial planning at local level by municipalities)	1:50 000
	Municipality	Not required	Local development scheme (varies from state to state, drawn up for the entire territory of the municipality) Zoning plan (determines the permissible use of land, drawn up for entire territory of the municipality) and Building regulation plan, that determines the use of building land	1: 10 000 to 1:5000 1: 2 500 to 1:1000
	State	Not required	Spatial Development Policy (sets the national development policy, definition of planning priorities, specific public investments)	1:500 000 to 1:200 000
	Region	Regional landscape plan (non obligatory)	Regional Plan (define the most relevant areas for development within the territory within the administrative region, location of the most important investment projects, the main transport corridors, etc.)	1:50 000
	Town/community	local landscape plan (non obligatory)	Local Plan (define the overall planning concept for a municipality, establish specific conditions for the development of certain areas)	1:10 000 to 1:5000
	Part of town/ community		Zoning regulation plan (define specific land uses for the area within a municipality)	1: 000 to 1:500

Country	Planning level	Landscape planning	Land use planning	Scale of maps
Slovak Republic	State	Not required	Spatial development perspective of Slovakia (define the principles for urban development (polycentricity)	1:500 000 to 1:200 000
	Region	Regional landscape ecological plan (optimal spatial arrangement of human activities based on landscape ecological conditions at regional level	Regional Plan (define the principles for urban development (polycentricity)	1:50 000 to 1:25 000
	Town/community	Local landscape ecological plan (optimal spatial arrangement of human activities based on landscape ecological conditions at regional level)	Local Plan (designate the areas to be developed and those where construction is restricted, locate transportation infrastructures, public utilities and protected areas)	1:10 000 to 1:5000
	Part of town/ community	Not required	Zoning regulation plan (regulate land uses in more detail, building conditions, links with public utility works)	1: 1000 to 1:500

as a tool for the protection of cultural heritage; or to landscape planning reflecting predominantly nature protection efforts. Landscape planning usually provides aims and principles for nature conservation and landscape management for land use planning procedures. Landscape plans identify measures for mitigation and/or compensation of significant adverse effects on nature and landscape of those actions proposed in land use plans. Haaren et al. (2008) pointed out that a close coordination of land use planning and landscape planning can only be utilised if landscape planning is drawn up at different levels and on different scales, just like the overall land use planning system or other sectoral planning of a spatial nature.

2.3.2 Land Use Planning And SEA

Strategic environmental assessment (SEA) is an environmental management tool that refers to the environmental assessment of plans, policies, programmes or legislation. SEA is deemed an essential mechanism for decision-making at the highest levels and contributes to sustainable development. Thérivel et al. (1992, in Thérivel and Partidário, 1996, p.4) defined SEA as “the formalised, systematic and comprehensive process of evaluating the environmental effects of a policy, plan or programme and its alternatives, including the preparation of a written report on the findings of that evaluation, and using the findings in publicly accountable decision-making”.

SEA follows the concept of EIA as a procedure of identification, prediction, assessment and mitigation of relevant effects on the environment. According to Lee and Walsh (1992) and Wood and Dejeddour (1992), SEA was first developed as a response to the limitations of EIA, as EIA was being applied too late in the process, and alternatives and impacts of the proposed development, were not being adequately taken into account and assessed.

As a process, SEA is directly linked to decision making and an integral part of the development of all policies, plans and programmes, with policies setting the framework for plans, which in turn set the framework for programmes, which finally set the framework for project level development and decisions (Thérivel et al., 1992; in Jones et al., 2005). This is commonly known as a “tiered forward planning process”; it can apply to all levels of decision making (from national, to regional, and local)⁸, and to land use planning and sectoral actions (Wathern, 1992).

Evolution of SEA concepts, systems and approaches in land use planning

As indicated in the previous section, the formal introduction of environmental assessment of land use plans took place in the United States in the 1970s, with the adoption of the National Environmental Policy Act (NEPA) in 1969. NEPA did not

⁸ it starts with formulation of a policy at the upper level followed by a plan, by a programme and then a project

differentiate between SEA and EIA, nor did it use the term “strategic environmental assessment” explicitly. It did however, introduce the term EIA as an impact assessment tool of “any major public decisions on new regulations, plans, programmes or projects” (Jones et al., 2005; Partidário, 2004), encompassing project level decisions as well as the more strategic decisions, such as those undertaken in land use planning, but without explicitly making a distinction between project- and strategic- level assessments. The widening of the scope of environmental assessment from EIA to more strategic assessments is reflected in practice, particularly in the methodological approach to the assessment of land use plans, known as “Programmatic EIA” and EIS (Environmental Impact Statement), also referred to as regional, cumulative or generic EIS.

Following the USA, environmental assessment was then introduced in Canada (1973), Australia (1974), West Germany (1975) and France (1976), though none of these systems offered a systematic approach to SEA. Within the EU the development of environmental assessment in land use planning was influenced by individual European countries’ initiatives and practices. It was not until the second half of the 1980s that environmental assessment practice in planning expanded (Wood and Dejeddour, 1992), with the creation of well established systems in California, Western Australia, New Zealand, Canada, South Africa, and many European countries, such as the Netherlands, Italy, Germany, Finland and the UK (Fischer, 2007). The term “Strategic Environmental Assessment” was first used by Wood and Dejeddour (1989) in a study commissioned by the European Commission (EC), which then led to the formal introduction of SEA as a new EIA tool for policies, plans and programmes (the later European Directive reduced the scope of SEA to plans and programmes only).

In comparison to EIA, SEA was intended to be more flexible, less quantifiable and more suitable to the reality and nature of land use planning. Two different approaches to SEA emerged: an “EIA-based” approach, which applies the EIA procedure and rationale to strategic documents, as the only fundamental difference between the two tools is the level of application (Thérivel and Partidário, 1996); and a “plan-based” approach, designed to respond to the comprehensive and multiple purposes, forward looking, and uncertain nature of spatial/land use planning (e.g. Lee and Walsh, 1992; Thérivel et al., 1992; Wood and Dejeddour, 1992; Sadler and Verheem, 1996; Thérivel and Partidário, 1996; Partidário, 2000; Partidário, 2004). Other terminologies associated with the plan-based approach were coined, and include Regional EIA, Strategic Environmental Assessment Analysis, Environmental Appraisal of Development Plans, Sustainability Appraisal of Regional Planning, Strategic EIA, Programmatic Environmental Assessment (Partidário, 2004). While the EIA-based model is mostly applied in the USA, Netherlands, Italy, South Africa, California and Germany; Canada, New Zealand, the UK and the Scandinavian countries have adopted the strategic plan-based approach (Verheem, 1992).

The most dynamic expansion of SEA applied to land use planning occurred in Europe in the 1990s, when the EU’s 5th Environmental Action Programme was

approved in response to the perceived failure of existing regulatory measures to achieve the European Community's environmental standards. Draft versions of SEA frameworks were therefore developed, with mostly accession countries (including Poland, Hungary, Czech Republic, Slovakia, Slovenia, Estonia, Latvia, Lithuania) taking part in numerous pilot SEA projects of regional development programmes, often a condition for accessing structural funds resources. Since then, SEA has been applied in various countries, with differences in sectoral areas of application, in the range of information collected, in public participation requirements and in the way in which SEA findings are taken into account in decision- policy, plan and programme-making and approval processes, resulting from different countries' legislative and planning frameworks (Lee and Walsh, 1992; Sadler a Verheem, 1996; Thérivel and Partidário, 1996; CEC, 1998; Elling, 2000; Kleinschmidt and Wagner 2000; Platzer, 2000; ICON 2001). These differences also extend to different countries having different decision-making cultures and traditions, particularly in terms of the way in which environmental issues are taken into account. But these differences suggest that for better and more effective decision-making SEA should always be tailored to context-specific planning needs.

Non EU countries have also introduced formal requirements for land use planning SEA – including China, South Korea, Norway, and NIS countries (Russia, Belarus, Ukraine, Kazakhstan, Turkmenistan, Armenia, Georgia, Moldova, Azerbaijan, Kyrgyzstan, Tajikistan, Uzbekistan). The NIS countries in particular have SEA elements that are based on the State Environmental Review (SER) system, established in USSR in the mid 1980s together with the so called OVOS (assessment of environmental impact requirements). Only Ukraine shows a high compatibility with the EU approach outlined in the SEA Directive (Cherp, 2001; Klees et al., 2002). The driving forces behind the development of SEA in NIS countries came mainly from international banks (World Bank) and international initiatives, such as the Sofia Initiative which aimed to demonstrate the benefits of applying SEA to business development, the community and the environment.

One of the important milestones in the development of SEA within Europe and beyond, is the adoption of the European Directive 2001/42/EC dated June 27 on the assessment of the effects of certain plans and programmes on the environment (the so called SEA Directive). The Directive does not use the term SEA explicitly; it instead refers to the environmental assessment of all kinds of land use plans, establishing a framework for future development consent of projects. The Directive also requires SEA for plans subjected to assessment under the Habitats Directive, though it excludes minor modifications to existing plans and programs and small area plans not having significant environmental effects. Further, the SEA Directive recognizes the concept of tiering and establishes procedural steps that mirror those outlined in the EIA Directive(s); like scoping, the consideration of alternatives, consultation and public participation requirements (including transboundary consultation), environmental report preparation, the consideration of assessment results in decision

Table 2.3: Overview of SEA systems in EU member states and outlines the above mentioned differences. Source: Belčáková (2016).

Country	Spatial/land use planning decision making levels	Formal requirements (separate EIA/SEA legislation or within planning legal instruments)	Scope of application in spatial/land use planning	SEA approach	Changes after SEA Directive transposition
Austria	National, state (lander), district/ regional, municipal	No legal requirement	Local land use plans, supra-local land use plans	EIA based	Amendment to land use planning sector
Belgium	National, regional, local	No explicit environmental evaluation	To some extent, Regional land use plans in Brussels and Flanders	EIA based	Amendment to existing EIA regulation – EIA and SEA Decree in Flanders
Bulgaria	National, regional, local	EIA Regulation No.1(1995)	National development programmes, all level land use plans	EIA based	Amendment to existing EIA legislation
Cyprus	National, regional, local	No legal requirement at all			Explicit SEA legislation – Law No. 102 (I) 2005
Czech Rep.	National, regional, local	Provisions for some form of SEA in EIA Act No 244/92	Regional and local land use plans, national development plan	EIA based	Amendment to existing EIA regulation – EIA Act No. 100/2001 Coll., different procedure for SEA of land use plans, SEA reflection in Law on Construction and Land Use Planning is under preparation
Denmark	National, regional/county, municipal	Some provisions in Prime Ministers Office Circular since 1997, voluntary basis since 1990	Regional and municipal land use planning documentation, local plans, national plan statements	EIA based	Explicit SEA legislation – Act on Environmental Assessment of Plans and Programmes
Estonia	National, regional, local	Provisions for some form of SEA in the Law on EIA and Environmental Audit	Local plans, national development plans or programmes	EIA based	Amendment to existing EIA regulation – Environmental Impact Assessment and Environmental management System Act

Country	Spatial/land use planning decision making levels	Formal requirements (separate EIA/SEA legislation or within planning legal instruments)	Scope of application in spatial/land use planning	SEA approach	Changes after SEA Directive transposition
Finland	National, regional, local	Building and Planning Act, EIA Act	Land use plans at all decision-making levels	EIA based	Explicit SEA legislation and also within land use planning regulations – Act and Decree on the assessment of the Impacts of the Authorities, Plans, Programmes and Policies on the Environment, Land Use and Building Act and Decree
France	National, regional, local	Decision of the French Parliament	Certain land use plans	EIA based	Amendment to environment code – one part specifically relates to spatial planning
Germany	Federal, state, regional (county), local	Formal landscape planning system - Federal Environmental protection Act, 1976	Local land use plans, local and regional landscape plans and programmes, state development plans, Small scale land use plans	EIA based + landscape planning approach	Amendment to existing EIA regulation – Act for Introducing SEA, also Federal Spatial Planning Act, Federal Construction Law
Greece	National, regional	No SEA legislation, but “EIA” of small scale land use plans took place		EIA based	No SEA legislation,
Hungary	National, county, municipal	Environment Act (1995)	Regional development plans	EIA based	Amendment of EIA Act in 2004 and Government Decree on the Environmental Assessment of Certain Plans and Programmes in 2005
Ireland	National, local	Government decision of 1978 No formal procedure	National land use plans, little experience with Master plans, local area plans	EIA based	Explicit SEA legislation – Environmental Assessment of Certain Plans and Programmes Regulations 2004, Planning and Development (SEA) Regulations 2004

Country	Spatial/land use planning decision making levels	Formal requirements (separate EIA/SEA legislation or within planning legal instruments)	Scope of application in spatial/land use planning	SEA approach	Changes after SEA Directive transposition
Italy	National, regional, local	Some formal SEA requirements, regional planning legislation (e.g. Regional Planning Law No.20/20)	Regional spatial plans	EIA based approach	Amendment to environment code – Act on Environmental matters, April 2006
Latvia	National, regional, local	Provisions for some form of SEA in EIA Law	Regional and local plans, national development plans		Amendment to existing EIA regulation – EIA Act on 26 February 2004
Lithuania	National, regional, local	Provisions for some form of SEA in EIA Law (1996) and territorial planning law of 1995	County comprehensive plans, district comprehensive plans, national development plans	EIA approach	Amendment to environment code – Law on Environmental protection of the Republic of Lithuania, Law on Territorial Planning
Luxembourg	National, regional, local	No SEA legislation			No SEA legislation
Malta	National, regional, local	No SEA legislation	Regional development plans	EIA approach	Explicit SEA legislation
Netherlands	National, regional, local	No SEA legislation, but “EIA” of small scale land use plans took place, several informal SEAs	Local land use plans	EIA based and integrated	Amendment to environment code – Environmental Management Act, revised in July 2006,
Poland	National, regional, local	Provisions for some form of SEA in the Law on Access to Information on the Environment, Its Protection and EIA (2002)	Regional and local land use plans, national development plans	EIA based	Amendment to existing EIA regulation / Act on Access to Information about the Environment and its Protection and on the Environmental Impact Assessment, and also Environmental protection Law

Country	Spatial/land use planning decision making levels	Formal requirements (separate EIA/SEA legislation or within planning legal instruments)	Scope of application in spatial/land use planning	SEA approach	Changes after SEA Directive transposition
Portugal	National, regional, local	Non standard approach to plan making, SEA not applied	regional and local land use planning and spatial programmes submitted to EU Structural Funds	EIA and policy based	SEA legislation is still under preparation
Romania	National, regional, local	Environmental protection Law No.137/1995	All land use plans	EIA based	Law on urban and territorial planning + Government Ordinance (2004)
Slovakia	National, regional, local	Provisions for some form of SEA in EIA Act No.127/1994, amended 2000)	Regional and local land use plans, national development plan	EIA based	Amendment to existing EIA regulation / New Act No.24/2006
Slovenia	National, regional, local	Provisions for some form of SEA in Environmental Protection Act (1993)	Regional and local land use plans, national development plan	EIA based	Environmental Protection Act
Spain	National, regional, local	Part of EIA legislation	Regional land use plans		Explicit SEA legislation / SEA law of April 2006
Sweden	Regional, local	National Resources Management Act	Local land use plans – mostly at municipal level	Integrated land use planning	Amendment to environment code, 2004
UK	National, regional, subregional, local	No statutory form of SEA, various non statutory measures at national level	Structure plans, local land use plans	Sustainability appraisal-policy based	Environmental assessment of Plans and Programmes Regulations 2004 (England and Wales – Planning and Compulsory Purchase Act of 2004 Scotland – Environment Assessment (Scotland) Bill)

making, monitoring and follow-up requirements (Jones et al., 2005). Similarly to EIA, the SEA Directive also requires the development of a sufficient quality report, including a “statement summarising how environmental considerations have been integrated into the plan and how the environmental report and the results from public consultations have been taken into account.” (EC, 2001).

According to Dalal-Clayton and Sadler (2005), the SEA Directive is probably the best known SEA framework law, and together with the SEA Protocol and the Espoo Convention (UN ECE, 2003) it influenced not only EU countries but stands as a “reference point” for countries in Asia, Africa and South America. The biggest influence of the SEA Protocol has probably been in the UNECE countries.

The implementation of the SEA Directive was accompanied by complications, illogicalities and duplications as many EU countries had pre-existing SEA approaches and experiences, and as already stated, different planning systems. According to Partidário (2004 and 2012), the approved version of the SEA Directive eliminated the efforts and expectations for a more planning and policy oriented evaluation tool, thus, a truly strategic instrument for EU member states. Instead, the Directive clearly represents a highly structured and technically oriented EIA-based model, as it mostly follows the procedural nature and layout of the EIA Directive. The Directive was also not very strict or prescriptive in telling individual member states how SEA should be introduced, thus, whether as an amendment to EIA legislation, or via separate SEA legislation or within planning legislation (ibid). However, Annex 1 of the Directive did “strictly” list the information that should be considered and elaborated upon in the required Environmental report.

EU member states were obliged to implement the Directive by the end of July 2004. In many countries this meant modifying existing legislation with the preparation of guidelines. With the exception of Portugal, Greece and Luxembourg, the Directive was implemented in all EU countries by June 2006 (Fischer, 2007). The second implementation report on Directive 2001/42/EC noted that the Directive does not lay down any measurable environmental standards. It is rather a process directive, which establishes certain steps that Member States must follow when identifying and assessing environmental effects. The report further stated that all EU member states had transposed the SEA Directive into their legal and administrative structure and arrangements (for example through specific national legislation or integration into existing provisions). Since 2007, more than half of EU member states have amended their national legislation transposing the SEA Directive to ensure that their national provisions fully comply with the Directive and to resolve cases of incorrect application.

The transposition of the Directive occurred in different ways in different countries, setting the legal foundations for different types of SEA systems. The nature of legal requirements used for the transposition of the Directive vary – from ministerial decisions to official regulations at the national, regional and local level,

depending on the degree of centralisation/decentralisation of land use planning in different countries. Following Fischer (2007), these include:

- Explicit SEA-specific framework laws: UK, Denmark, Spain, Ireland, Malta, Cyprus, Finland and Hungary (the latter two not in combination with land use planning),
- Amendments to existing EIA regulations: Belgium, Estonia, Latvia, Czech Republic,
- Amendments to existing EIA regulations in combination with amendments to land use planning legislation: Slovakia, Poland and Germany,
- Amendments to an Environment Code: The Netherlands, Slovenia, Italy,
- Amendments to an Environment Code in combination with amendments to land use planning legislation: Sweden, Lithuania, France,
- Amendments to land use planning: Austria.

Several countries prepared their specific guidelines for land use planning SEA—e.g. UK, Sweden, Finland, Denmark, Poland, Ireland and Hungary. Thanks to the activities of development banks (World Bank), international aid organisations (UNDP, OECD) and donor agencies, vast experience with SEA has developed in more than 30 developing countries (Dalal-Clayton and Sadler, 2005).

SEA practice in land use planning is now well-established, with the literature populated by practice reviews and numerous case-studies covering different sectoral applications, emphasising different procedural aspects or requirements, or more simply, practice in different regions across the globe. Evaluations of European SEA practice have also been conducted by the EU, with the first evaluation reports focusing on the Directive's formal requirements (Lee and Hughes, 1995), and more recent evaluations on SEA quality and effectiveness. The evaluations conducted by Jones et al. (2005), for example, differentiate between the so-called process input and output criteria. While the first are represented by evaluations of legal, institutional arrangements, SEA procedures and methods; the latter refers to the evaluation of SEA against the goals set or SEA contributions to good land use planning practices. The very recent evaluation on the effectiveness of the SEA Directive has been adopted by the Commission in 2017, following the previous report published in 2009. The 2017 report examined the application of the SEA directive across EU Member States using five criteria: effectiveness, efficiency, relevance, coherence and EU-added value (https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2017-3481432_en#initiative-details).

2.3.3 SEA And Land Use Planing – Rational And Potential Benefits

SEA can assist land use planning in many ways. Sustainable development is the common objective for both, land use planning and SEA, which are also instrumental for achieving sustainable development (Partidário, 2000). As noted by Wood (1992), land use planning is an area of application to which environmental assessment is

most commonly applied to. SEA can deliver environmental improvements and raise environmental awareness in land use planning, and it can also help reduce the negative and enhance positive environmental impacts associated with the implementation of spatially relevant plans (Jones et al., 2005). Other reasons for applying SEA to land use planning are (Brown and Thérivel, 2000; Sadler, 2001a; Sadler, 2001b; Owens and Cowell, 2002; Thérivel, 2004 in Jones et al., 2005; Partidário, 2004):

- SEA can evaluate the consistency and compatibility between aims, strategies and policies of a particular plan, stressing potential linkages, while identifying potential conflicts and interactions,
- SEA can improve the environmental quality of planning policies,
- SEA can raise awareness of environmental impacts,
- SEA can inform stakeholders of the environmental impacts of strategic decisions,
- SEA can help to avoid delays in plan implementation by highlighting how environmental issues have been taken into account during decision making,
- SEA can identify issues to be monitored during the implementation of plans,
- SEA can improve the green image of planning authorities,
- SEA can facilitate the earlier consideration of environmental impacts, the examination of a wider range of potential alternatives, generation of mitigation measures and the potential to address a wider range of impacts,
- SEA has the potential to streamline the EIA process by focusing on the most significant project issues.

Often, planning practitioners claim that land use plans already meet many of SEA's requirements. This can partly be true, as many national and European environmental and nature conservation legislation do overlap, leading to confusion in planning and approval procedures and in waste of time and money (Hoppenstedt, 2003). As noted by Wood (1992), in many countries land use planning systems already included a number of elements relevant to SEA within their respective plan-making processes, prior to the introduction of the Directive. These include for example, the statutory recognition of environmental goals within the broad plan making context, planning documentation already containing baseline analysis, indication of future prospects and alternatives, policies for environmental improvement, public participation procedures as well as consequent revision of the plan during subsequent stages of the planning process. Planning practitioners also claim that when conducting land use planning SEA, conflicts between environmental protection and sectoral or developmental interests can emerge, but cannot be solved within the SEA process. While SEA can enhance the transparency and comprehensiveness of decision-making and make these conflicts explicit, they ultimately require political solutions. The systematic, documented and evidence-based nature of SEA should help inform decision-making, even if the decision made is a political one.

2.3.4 Application Of Landscape Impact Assessment Within SEA And Land Use Planning

Following LI and IEMA (2013), the principles for landscape impact assessment practice determined at project level EIA can be applied to the plan (programme, policy) level, and therefore to SEA. An advantage of conducting landscape impact assessment in SEA is the consideration of cumulative effects of potential development proposals at very early stages of land use planning. There are several approaches of landscape impact assessment in SEA, which depend on the planning traditions and frameworks of individual countries. The approach described by LI and IEMA (2013) and SNH (2007) is based on the *identification of landscape change and of the forces underpinning that change*.

When conducting a LIA in SEA, a land use plan (programme or strategy) is evaluated against criteria relating to:

- the conservation and enhancement of a landscape's character and scenic value,
- the protection and enhancement of the landscape everywhere and particularly in designated areas,
- the protection and enhancement of diversity and of a landscape's local distinctiveness,
- the improvement of the quantity and quality of publicly accessible open space,
- the restoration of landscapes degraded as a consequence of past industrial activity.

In SEA it is not possible to assess landscape change with the same level of detail required in an EIA. At the strategic level, the scope of SEA is limited to identifying potential broad changes in landscape characteristics such as landform, land use and land cover, the relationship between landform and land use, field pattern and boundaries, buildings and structures in the landscape, settlement patterns as well as landscape visual quality (SNH, 2007). However, similarly to EIA, Landscape Character Assessment (LCA) can be embedded within the SEA process, as it provides a baseline against which change can be assessed and monitored. Landscape capacity and sensitivity studies are also influential in informing baseline studies of landscape impact assessment within SEA.

Other approaches used in landscape-based SEA are *associated to different forms of landscape planning* conducted as part of a land use planning process (or a separate landscape planning procedure that is consistent and in compliance with the land use planning procedure). According to Haaren et al. (2008) and others (Hoppenstedt, 2003; Schmidt et al., 2005), landscape planning belongs to a set of instruments that supports the effective consideration of landscape in SEA. In these cases, landscape planning can significantly contribute to the application of SEA-based landscape impact assessment by providing guidance on the current status and future landscape development of a particular spatial area.

The requirements of the SEA Directive with landscape planning documentation do overlap to a certain extent. In many countries⁹, landscape planning is dependent on objectives from, and embedded within, other environmental and/or sectoral planning (e.g. water management, agriculture, air pollution, supply and disposal). In addition to setting objectives for nature conservation, landscape planning also acts as a framework for assessing all relevant environmental objectives to establish a more consistent and coherent system of objectives. Another task of landscape planning is to develop scenarios for site identification (for example residential development or soil degradation) and to take them into consideration.

Hanusch and Fischer (2011) reviewed possible linkages and benefits between SEA and landscape planning instruments in Germany, Canada, Ireland and Sweden. The analysis focussed on objectives, contents, methods and procedures; their findings are that:

- landscape plans and SEA act as advocate instruments for the environment,
- SEA and landscape planning aim at integrating considerations on the environment, nature, biodiversity and landscape into decision-making and planning,
- there are many overlaps regarding the contents of an SEA environmental report, such as the collection of environmental baseline data, the outline of environmental objectives and the assessment of likely significant effects; and the baseline data included in landscape plans. As such, landscape plans can function as a comprehensive information source for SEA,
- landscape planning can contribute to impact analysis and evaluation as well as alternatives assessment and compensation measures,
- there is a range of procedural linkages between SEA and landscape planning, for example timing of planning procedures, alternatives, public participation and monitoring.

2.3.5 Procedural Steps In Landscape Impact Assessment Within Strategic Environmental Assessment Of Land Use Plans

Similarly to EIA, landscape impact assessment can be conducted as part of Strategic Environmental Assessment. The SEA and EIA procedures are very similar, but there are some *differences* (EC, 2017):

- SEA requires *environmental authorities* to be consulted at the screening stage,
- SEA requires an assessment of reasonable *alternatives* (under the EIA the developer chooses the alternatives to be studied),
- the SEA Directive obliges EU member States to ensure that environmental reports are of a sufficient *quality*.

⁹ for example Germany, Austria, Slovak Republic, Czech Republic, Slovenia, Switzerland

Figure 2.3 provides a flow chart of the SEA and landscape impact assessment process.

Figure 2.3: The SEA and the LVIA process. Adapted from EC (2017) and CCW (2007).

Following the SEA Directive, the process of landscape impact assessment within the SEA process includes the following procedural stages (Jones et al. 2005; SNH 2007; CCW, 2007):

Screening: it aims to consider whether SEA is required or not. To answer this question, it is helpful to look at the purposes of a land use plan and at expected impacts. Within the EU, Article (3) (4) and (5) of the SEA Directive establishes the process of determining whether plans are likely to have significant environmental effects and thus require a SEA. Member States have to take into account the significance criteria set out in Annex II and presented here in Box 2.2.

Box 2.2: Screening criteria according to SEA Directive. Source: Official Journal of the EC (2001).

Criteria for determining the likely significance of effects referred to in Article 3(5)

1. The characteristics of plans and programmes, having regard, in particular, to
 - the degree to which the plan or programme sets a framework for projects and other activities, either with regard to the location, nature, size and operating conditions or by allocating resources,
 - the degree to which the plan or programme influences other plans and programmes including those in a hierarchy,
 - the relevance of the plan or programme for the integration of environmental considerations in particular with a view to promoting sustainable development,
 - environmental problems relevant to the plan or programme,
 - the relevance of the plan or programme for the implementation of Community legislation on the environment (e.g. plans and programmes linked to waste-management or water protection).
 2. Characteristics of the effects and of the area likely to be affected, having regard, in particular, to
 - the probability, duration, frequency and reversibility of the effects,
 - the cumulative nature of the effects,
 - the transboundary nature of the effects,
 - the risks to human health or the environment (e.g. due to accidents),
 - the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected),
 - the value and vulnerability of the area likely to be affected due to:
 - special natural characteristics or cultural heritage,
 - exceeded environmental quality standards or limit values,
 - intensive land-use,
 - the effects on areas or landscapes which have a recognised national, Community or international protection status.
-

This stage also aims at examining the goals and objectives of the plan and its purpose against landscape criteria considering several questions: a) are the environmental problems in the plan area related directly or indirectly to its landscape? If so, does the plan make a significant contribution to resolving those problems or does it significantly exacerbate them? b) what is the magnitude and spatial extent of effects on the landscape, including the geographical area likely to be affected? c) what is the magnitude and spatial extent of effects on people's enjoyment of the landscape, including the number of people likely to be affected in the context of their sensitivity to change in the landscape? d) what is the value of the landscape likely to be affected and its vulnerability to change due to its special natural characteristics or cultural heritage (e.g. wildness)? e) what are the effects on areas or landscapes which have a recognised local, regional, national, EC or international protection status? f) What is the probability/likelihood or risk of these effects on the landscape occurring and being significant if they occurred?

The involvement of the public and other stakeholders is an integral part of the screening step.

Scoping/baseline studies/objectives and targets: Scoping is the stage of the SEA process that determines the content and extent of the matters to be covered in the SEA report to be submitted to a competent authority. Considerations about whether a plan meets requirements of relevant policies, landscape protection objectives, international targets, etc. are included.

Defining landscape objectives, indicators and checklists is a critical element within the scoping stage. It is the setting of the environmental ‘objectives’ and subsequent ‘tests’ against which the emerging plan will be assessed. The environmental objectives are usually adopted from international, EU and national policy frameworks and by objectives tailored to more local landscape policy frameworks.

Alternatives to a proposed land use plan should be identified, and assessed in terms of their costs, benefits and landscape impacts. Key landscape issues should also be identified. During this stage a series of landscape impact assessment objectives/criteria are developed against which the plan’s performance is predicted. Very often targets and indicators based on landscape (environmental) criteria can be used for monitoring the implementation of a plan. Data about the present state of landscape conditions are gathered and analysed.

Impact prediction/assessment: Impact prediction is based on landscape impact assessment objectives and criteria. Predictions should be made with the help of baseline landscape data. Impact prediction very often involves subjective and objective assessment. Mitigation measures are part of this stage.

Annex 2 of the SEA Directive recommends assessing impacts in terms of a number of criteria listed in Box 2.2, which can then result in a more detailed classification of impacts according to pre-defined criteria. Table 2.4 provides an example of such classification.

The intensity of impacts is one of the most frequently described indicators, which is often expressed numerically. Some other examples of landscape impact assessment are provided in Tables 2.5 – 2.8. Table 2.5 in particular shows an example of a hierarchy of intensity of effects on the landscape, and possible combinations of intensity of impacts with the nature of impact on the landscape. Table 2.6 is an example showing the impact on landscape scenery based on the sum of (mathematical sum of intensity values) the likely impacts on landscape image, scenery and characteristic landscape appearance. The impact is expressed by the degree of impact. The resulting expected impact on the landscape scenery presents therefore either a visual collision rate of new objects with the landscape’s current appearance, or a measure of positive contribution to the landscape’s scenery.

The visibility of individual objects in a landscape panorama and the extent to which they contribute to visual perceptions of the territory are important aspects to consider when assessing impacts on scenery, as illustrated in Table 2.7. The example of levels of significance of potential impacts on the landscape image are illustrated in Table 2.8.

Table 2.4: Classification of impacts on the landscape according to selected criteria. Source: Pauditšová (2014).

Classification criteria of impact		Impact
1.	Impact based on its substance and probability	Positive Negative neutral (resp. without prediction)
2.	Impact based on its original occurrence	Primary Secondary
3.	Impact nature	Direct Indirect
4.	Impact magnitude	Temporary Permanent
5.	Impact frequency	regular or irregular Continual
6.	Impact reversibility/irreversibility	short –term (less than 6 months) mid-term (6-12 months) long-term (more than 12 months)
7.	Impact spatial area	Local Regional National Global
8.	Impact intensity	very important negative impact Important negative impact low important negative impact no impact low important positive impact very important negative impact very important positive impact
9.	Impact degree	Individual Synergic Cumulative

Table 2.5: Numerical expression of an “intensity of the impact” and possible combination of intensity of impact with the nature of the impact on the landscape. Source: Pauditšová (2014).

Predicted impact intensity	Numerical expression	Impact nature
		Direct impact (DI)/Indirect impact (II)
Very important negative impact	- 3	DI/II
Important negative impact	- 2	DI/II
Low important negative impact	- 1	DI/II
No impact	0	-
Low important positive impact	+ 1	DI/II
Important positive impact	+ 2	DI/II
Very important positive impact	+ 3	DI/II

Table 2.6: Summary impact on the landscape scenery. Source: Pauditšová (2014).

Expected impact on the landscape scenery		Interval of sum of intensity impact values: A+B+C	Degree of impact
Visual collision with new objects	Essential to critical; extreme degradation of landscape scene of a regional scale, visible from long distances and from all observation points	(- 9; - 8)	- 5
	Very important; strongly visible degradation of landscape scene (regional or local scale), visible from long distances from most observation points	(- 8; - 6)	- 4
	significant; degradation of landscape scene is clear, but is visible only from certain observation points, good weather conditions are needed for good visibility	(- 6; - 4)	- 3
	Less significant; changes in landscape scene are of local nature, visible from short distances, good weather conditions are needed for good visibility	(- 4; - 2)	- 2
	negligible; visual changes in landscape scene are minimal (local scale) and are visible only from minimal number of observation points	(- 2; - 0)	- 1
No visual collision of new objects; positive visual contribution of new objects – none		0	0
positive contribution of new objects for landscape scene is	negligible (local scale); visible only from minimal number of observation points	(2; 0)	+ 1
	Less significant (local scale); visible from short distances, good weather conditions are needed for good visibility	(4; 2)	+ 2
	significant (regional or local scale); visible only from some observation points, good weather conditions are needed for good visibility	(6; 4)	+ 3
	Very important (regional or local scale); visible from long distances, from most of observation points	(8; 6)	+ 4
	Essential (regional scale); visible from long distances and from all observation points	(9; 8)	+ 5

A = impact on landscape image; B = impact on scenery; C = impact on characteristic landscape appearance

Table 2.7: Degrees of impacts of the plan according to the intensity of visual influence on the scenery. Source: Paudítšová (2014).

Level of intensity of expected impact	Numerical expression of impact intensity	Characteristics of the impact of activity (plan) on the scenery
Highly significant negative impact	- 3	Object(-s) well visible, in the landscape panorama they are often outstanding, representing dominating feature, are extremely disturbing regardless of the weather conditions (except when exceptionally the visibility is minimal)
Significant negative impact	- 2	Object(-s) well visible, in the landscape panorama are prominent and are disturbing; intensity of their negative perception depends on the quality of the weather conditions
Less significant negative impact	- 1	Object(-s) less visible, in landscape panoramas they do not make such an impact, often are partially covered by visual barriers – other landscape elements; under certain weather conditions the objects under assessment are difficult to distinguish; visually they are about the same level as most of other landscape features around
No impact	0	Object(-s) not visible, in landscape panorama do not make quite an impact
Less significant positive impact	+ 1	Object(-s) hardly visible, minimum contribution to the attractiveness of landscape panoramas; often are partially obscured by visual barriers, other landscape features; under certain weather conditions the objects under assessment are hardly distinguishable; visually they are about the same level as most of other landscape features around
Significant positive impact	+ 2	Object(-s) well visible, contribute to the attractiveness of landscape panoramas, not disturbing; the intensity of their visual perception depends on the quality of weather conditions
Very significant positive impact	+ 3	Object(-s) constitute a major dominating element in the landscape that radically changes the landscape panorama in a positive way, contributing to its increased attractiveness; object(-s) very well visible in the landscape panoramas (except when in exceptional weather conditions the visibility is minimal)

Table 2.8: Degrees of impact of plan according to intensity of visual effects on the landscape image.
Source: Pauditšová (2014).

Level of intensity of expected impact	Numerical expression of impact intensity	Characteristics of the impact of activity (plan) on the landscape image
Highly significant negative impact	- 3	Object(-s) well visible, clearly visually distinguishable from other features of the landscape, are significant negative landmark of the landscape, which radically changes the landscape image; it is visible from many observation points and a distance of over 20 km; visibility of such objects in the landscape cannot be substantially alleviated
Significant negative impact	- 2	Object(-s) established in the landscape image very clearly, their negative visual expression can only be partially influenced or mitigated by other, mostly larger or otherwise conspicuous elements of the landscape in the surrounding area
Less significant negative impact	- 1	Object(-s) in the landscape image applied negatively only partially, are only visible from certain observation points, or only part of the activity (plan) is visible; mostly hardly distinguishable in the landscape, their negative visual impact is shown only under ideal visibility, when slightly noticeable
No impact	0	Object(-s) almost not make any impact on the landscape image, hardly distinguishable in the landscape, visually blend into the existing landscape features
Less significant positive impact	+ 1	Object(-s) in the landscape image applied positively only partially, visible only from certain observation points or only part of the activity (plan) is visible; mostly hardly distinguishable in the landscape, their positive visual impact is demonstrated only under ideal visibility, when slightly less noticeable
Significant positive impact	+ 2	Object(-s) established in the landscape image clearly and unequivocally, their positive visual expression is reduced, because from certain observation points are covered by other, mostly larger or otherwise conspicuous elements of landscape of the surrounding area
Highly significant positive impact	+ 3	Object(-s) representing action (plan), are well visible, clearly visually distinguishable from other landscape features and is a major positive landmark in the landscape, which radically changes the landscape image; object(-s) prominent and visible from many observation points, to a distance of over 20 km, visibility in the landscape not needed to be eased, on the contrary, positively enliven the landscape mosaic

Environmental report: According to the SEA Directive a publicly available SEA report should be prepared to document the main findings of landscape impact assessment within SEA together with a non-technical summary. The report should be available for public inspection being a part of land use planning documentation. The minimum requirements for SEA report content includes a description of plan proposals and its alternatives; a description of baseline environment; the significant environmental impacts of plan proposals and alternatives; the timescale of predicted impacts; mitigation measures; comments on assessment problems and uncertainties. As indicated in the previous section, landscape planning can contribute to impact analysis and evaluation as well as alternatives assessment and compensation measures (see Box 2.3).

Box 2.3: Contents of SEA Directive (Appendix 1 of SEA Directive) and regional landscape plan - a comparison. Adapted from Hoppenstedt (2003) and Haaren et al., (2008).

<p>SEA Report</p> <ul style="list-style-type: none"> a) an outline of the contents, main objectives of the plan or programme and relationship with other plans and programmes b) the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme c) the environmental characteristics of areas likely to be significantly affected 	<p>Regional landscape plan</p> <ul style="list-style-type: none"> a) an outline of environmental relevant objectives (e.g. priority areas and reservation areas as well as spatial-relevant projects) of the regional land use plan) b) landscape analysis regarding aspects of soil, water, air/climate, fauna/flora, natural scenery and cultural assets, prognosis of the likely evolution of the state of the environment without implementation of the plan c) assessment of the sensitivity of an area on the basis of the landscape analysis and as a condition for spatial development and project alternatives
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Monitoring: Monitoring allows for the results of the environmental assessment to be compared with the outcomes from the implementation of plans and programmes, in particular the significant environmental effects. The SEA Directive does not prescribe the exact arrangements for monitoring the significant environmental effects, the frequency of the monitoring, its methodology or the bodies in charge of monitoring. Monitoring can be based on standard monitoring indicators, sometimes set in the national legislation, or be on a case-by-case basis. Environmental monitoring arrangements set up in other Directives, such as the Water Framework Directive, the Habitats Directive, and the Industrial Emissions Directive can be helpful in this stage.

2.4 Landscape Impact Assessment In The Context Of Environmental Health And Climate Change

Landscape impact assessment *in the context of environmental health* should be part of the assessment of environmental impacts of policies, plans, or projects. The concept of environmental health was created from the terms human health and public health. Public health of the population is determined not only by the quality of health care services, but also by economic, social, psychological and environmental factors.

As already noticed, there is a link between landscape impact assessment and environmental health. The World Health Organization, when defining environmental health, takes as a basis the quality of life of an individual: “It is the individual perception of one’s position in life, in the context of culture and of the value system, in which the individual lives. Quality of life expresses the relationship of individuals to their own objectives, expected values and interests. It includes, in a comprehensive manner, the somatic health of an individual, mental state, level of independence from the surroundings, social relationships, an individual’s faith, and that all in relation to the main characteristics of the environment.” (The WHOQOL Group, 1995).

According to the International Association for Impact Assessment the assessment of impacts on health is part of environmental impact assessment, which includes impacts on landscape. They define Health Impact Assessment (HIA) as a combination of procedures, methods and tools that can be used for assessing policy, plan, programme or project in different economic sectors on the basis of potential effects on the entity under assessment on the health of the population using quantitative, qualitative and participatory techniques (IAIA, 2006).

Knowing that the policies and strategies of the various sectors can have a serious impact on health, occurrence or prevention of diseases, has lead to a more integrated approach to the consideration of health in the countries of the European Union. The aim of HIA is to improve the understanding of the potential impact of a policy, programme or project on health and to present adequate information to managing entities and people affected by the given programme or project (activity). The result should be to adapt the proposed policy, programme, or project in order to reduce or minimize the likely negative effects, and on the other hand, if possible, to increase positive effects (Halzlová and Drastichová, 2014).

From such a perspective the evaluation of expected impacts on the landscape is a substantial step in both spatial policy making and planning and requires standardization of the assessment procedure.

Despite the international efforts, the assessment of impacts on the health of population remained on the level of national interests. HIA is voluntary at the European level, though EU member states can set their own requirements¹⁰.

In the process of EIA and SEA, landscape represents a separate item, whether within the territorial characteristics or in the stage of identifying the predicted impacts. In other respects, however, the landscape mirrors a space where all the processes of the individual components of the environment are under way. For this reason, the cumulative effects on landscape need to be emphasized in assessing the impact of projects (plans) on the landscape in terms of *climate change impacts*. In addition, the climate phenomena has the intersectoral impacts, so the effect on the individual parts of the landscape overlap. The landscape is a pointer where the impacts can be put together and can be determined in detail at a component level.

On this basis, and as reflected in national legislation of many European countries, it makes sense for landscape impact assessment to encompass the risks arising from climate change. The revised EIA Directive adopted by the European Commission in 2012 (October 26, 2012), for example, includes an appeal for integrating climatic change and biodiversity into environmental impact assessments. The idea of assessing scenarios of biodiversity development within the context of a changing climate, directly supports the idea of landscape assessment as a space where all processes take place and impacts are assessed.

The EIA Directive shows not only how climate change is clearly referenced in the legislation, but that it should be given more weight in light of the Directive's preventive intent or 'spirit'. It also discusses the benefits and challenges of integrating climate change into EIA. The EIA Directive contains a number of principles that provide the basis for considering climate change in EIA, even though it does not refer to either term explicitly. In line with Article 191 of the Treaty on the Functioning of the European Union (The Treaty on the Functioning of the European Union, 2010, p. 47), the Directive clearly sets out to prevent damage to the environment rather than merely counteract it. The EIA Directive has a wide scope and a broad purpose (Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, 2013) and therefore needs to be interpreted as such. The 2012 Commission proposal for the revised EIA Directive (Proposal for a Directive of the European Parliament and of the Council amending Directive 2011/92/EU) strengthened the provisions related to climate change and biodiversity.

¹⁰ For example, since 2014, Slovakia strengthened its legal system in matters of impact assessment on public health, with the Decree of the Ministry of Health of SR no. 233/2014 Coll. In the UK, planning practice guidance clearly states that planning has an important role in promoting the health and well-being of communities, and the importance of this role is emphasised by the number of links between planning and health in the National Planning Policy Framework.

Assessing the risk of climate change as well as the resilience and vulnerability of a project or plan to climate change, is important and should take into account:

a) the specific geographic area (local impacts) in which the proposed project is to be implemented (eg. whether the area is susceptible to erosion, landslides, earthquakes, etc.); b) the specific climatic events that have taken place in the past (e.g. extreme precipitation/storms, wind, extreme temperatures, as well as temperature changes); c) the characteristics of a specific project or plan.

Both climate change and landscape involve complex systems and interact with people. Since we cannot fully understand all aspects of complex systems at the point in which we make decisions, we need to be able to use what we have (e.g. available studies, reports, databases and other sources of information).

After identifying the specifics of the territory, it is necessary:

- to evaluate the current state of the risks and to assess the future state of the risks, meaning what can be expected in the future regarding climate change and how will the proposed project or plan respond to climatic changes, which risks can be expected (type, intensity, frequency, and possibly a worst and best case scenario),
- to identify and to assess possible adaptation measures, such as how well a project or plan is adapting to the implications of climate change (e.g. by developing an emergency plan of what to do in a climate event, whether particular considerations need to be made in the construction phases or in the choice of materials used),
- to identify how the operation and maintenance of the project, plan or programme adapts to climate change/risk, and whether specific requirements should be proposed.

The aim of this procedure is to reduce the risks and to integrate the adaptation plan into the development of a project/plan, subjected to environmental assessment.

Climate change and landscape issues should be included into EIA and SEA processes during both *screening* and *scoping* stages. The issues and impacts relevant to a particular EIA or SEA will depend on the specific circumstances and context of each project/plan (e.g. location, characteristics of the environment, etc.). Three steps are particularly important (McGuinn et al., 2013):

- to identify key issues early on, with input from relevant authorities and stakeholders,
- to determine whether the project (plan) may significantly change greenhouse gas emissions, and if so, then the scope of necessary greenhouse gas assessments (climate mitigation concerns) should be defined,
- to be clear about the climate change scenarios used in the EIA or SEA, so that the key climate change adaptation concerns can be identified, as well as how they interact with other issues considered within an EIA or SEA.

Involving relevant authorities and stakeholders at an early stage of the assessment process will make it possible to capture the most important issues and establish a consistent approach for assessing impacts and for formulating solutions, or better

recommendations. Following McGuinn et al., (2013), making use of the knowledge and opinions of environmental authorities and stakeholders can help to highlight potential areas of contention and areas for improvement in a timely and effective way. Furthermore, it can provide information on relevant forthcoming projects, policies and legislative or regulatory reforms, other types of assessments that should be considered when analysing evolving baseline trends; and finally, it can help collect suggestions for building climate change mitigation and adaptation measures and/or landscape quality (ecological quality, visual quality etc.) enhancement schemes into the proposed project or plan from the very beginning.

When addressing climate change adaptation concerns as part of EIA and SEA, climate data and scenarios must be taken into account. A clear description of the climate change scenarios facilitates discussion on whether the expected climatic factors should be considered in the project (plan) design. Also, it is important to review any existing adaptation strategies, risk management plans and other national or sub-regional studies on the effects of climate change, as well as proposed responses and available information on expected climate-related effects relevant to a project or strategic plan. Figure 2.4 shows the steps of EIA and SEA processes with a set of questions related to specific climate change topics.

Addressing climate change in EIA/SEA makes it easier to comply with the EIA/SEA Directives and relevant national laws. Member States are also likely to have a suite of legislative instruments relevant to climate change and landscape protection (e.g. planning policies that avoid developing flood prone areas).

Europe's infrastructure needs to be adapted to better cope with natural phenomena caused by climate change and with negative impacts for landscape. This means considering that the parameters identified at a project's inception may no longer be valid at the end of its potentially long lifespan. This idea is important for a shift in thinking, from the traditional assessment of environmental impact to taking possible long-term risks into account. The plans and projects need to be assessed against an evolving environmental baseline. SEA and EIA should show an understanding of how the changing baseline can affect a plan or project and how they may respond over time. The EIA and SEA processes are particularly important since they can help set the context for identification of potential climate change impacts (including disaster risks in landscape).

Figure 2.4: Integrating climate change and landscape into EIA. Modified from McGuinn et al., (2013).

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