



Confronting reality in strategic environmental assessment in Slovenia – Costs and benefits



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ARTICLE INFO

Article history:

Received 24 April 2014

Received in revised form 21 July 2014

Accepted 2 August 2014

Available online xxxx

Keywords:

CBA

SEA

Optimisation

Planning process

ABSTRACT

We enlarge on the viewpoint published in the *Environmental Impact Assessment Review* in 2012 – *A viewpoint on the approval context of strategic environmental assessments*. Additional alerts concerning the procedural ineffectiveness of the strategic environmental assessment (SEA) process from the cost–benefit point of view are advanced. The major contribution to the long lasting, costly SEA processes, comes from ultraistic treatment of Natura 2000.

The case study deals with a plan for constructing a traffic bypass around Škofljica, a town near Ljubljana. Based on their conclusions the authors propose that the following elements of the SEA procedure should be improved and optimised:

- CBA for SEA should become a regular component when measuring its effectiveness.
- Concretisation of expected SEA inputs to the plan should clarify its role at the earliest stage of the process.
- SEA should contribute interactively to the optimisation of alternatives; cost–benefit analysis of the SEA process could support this process.
- Nature protection interest should be confronted and balanced with wider development interests as formulated in the plan and should not be applied in absolute terms (e.g. Natura 2000).

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Introduction

The latest European Commission (EC) report on the application and effectiveness of the SEA Directive – Directive 2001/42/EC (COM(2009) 469) – reveals numerous and substantial deficiencies of the SEA procedure in the majority of member states (MS). In a reflection on this report, Kontić and Kontić (2012) deal with the inadequacies of the approval/permitting context of SEA. This viewpoint was aimed at drawing attention to the gradually prevailing approval of the purpose of strategic environmental assessments (SEAs) in Slovenia and in some other countries of the EU. The key issue, according to the authors, is that the administrative, permitting context of SEA has ousted the primary goal of environmental impact assessment, namely optimisation of development proposals – plans and programmes (P&P) – in favour of causing minimal environmental impact. In addition, the approval context moved the basic philosophy of environmental evaluation from the area of environmental protection interests, integrated with coherent social and economic development, to the area of political power for deciding about land-use, spatial

management and acceptability of a particular economic development proposal. In addition to these views the present paper emphasizes the effects of extreme treatment of Natura 2000 on costs and efficiency of SEA. For example, Alterra reports how unclear information in the selection phase of the Natura 2000 sites and supplementary step by step addition of more and more sites to the Natura 2000 network, leads to misunderstanding and frustration of stakeholders – this has occurred in several countries (Alterra, 2010). Beunen et al. (2013) also conclude the implementation of Natura 2000 to be a failure in the Netherlands. In the first years after 2000, most actors in the Netherlands were surprised that the presence of small creatures (e.g., the hamster, *Cricetus cricetus*, the Natterjack toad, the sand lizard, etc.) was sufficient reason to stop major developments. Surprise quickly turned into irritation and frustration because developers, entrepreneurs and the local governments involved found that the legal requirements caused costly delays, expensive lawsuits and lingering uncertainty. Thus nature conservation became increasingly viewed as a brake on economic development. Several examples of conflict are identified, e.g. no construction of wind mills: Lewis Wind Farm in the UK (The Scottish Government, 2008), and a wind farm at Volovja reber in Slovenia (Golobič, 2005); restriction on port expansion in Antwerp, Belgium (OECD, 2005) and the Port of Rotterdam (Palerm, 2006); fishing rights for cockles in the Wadden Sea (Swart and Van Anel, 2008), etc. For Slovenian cases (Golobič, 2005; Kaligarič, 2010;

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Urbis, 2007a, 2012); the duration of SEA processes is clear: they lasted more than five years each, due to ineffective countering of the Natura 2000 approach. Based on information in the literature it can be concluded that other cases also lasted longer than initially expected. However, costs of the prolonged SEA processes were not discussed in reports.

Gantioler et al (2010) made a review study, commissioned by the EC, of the costs and benefits of the Natura 2000 system which shows that, even though our knowledge on the value of biodiversity, ecosystems and their service is steadily increasing, there is still an apparent lack of quantitative/monetary and well-documented information on the socio-economic benefits associated with protected areas in Europe. According to the review carried out in the context of the cited study, existing information on the socio-economic significance of Natura 2000 is mainly related to benefits arising from direct and indirect employment supported by the Natura 2000 sites. Although information is available on the socioeconomic impacts of cultural ecosystem services, in particular tourism and recreation, there is a clear shortage of well-documented examples demonstrating and, in particular, quantifying the value of other ecosystem services relevant in the context of the network, such as sustainable production of certified products from Natura 2000 sites, and the role of Natura 2000 areas in purifying water and maintaining healthy populations of species, such as pollinators and natural enemies of pests (Constanza et al., 1997; Dixon, 2008; Dixon et al., 1994; Econ Pöyry, 2010; Environmental Valuation I and II, 1999; Flyvbjerg, 2005; Haneman, 1992; Hufschmidt et al., 1983; King and Price, 2004; Kneese, 1964). In addition, the available information (e.g. information on employment and tourism linked with Natura 2000) is based on a rather sporadic collection of local case studies and examples, making it difficult to form a coherent picture of the associated benefits on a broader scale. Only a handful of studies that try to assess the gross/net benefits of Natura 2000 at the regional or national level (Gantioler et al., 2010) exist. These studies also often focus on a limited number of socio-economic impacts (e.g. excluding several ecosystem services), therefore falling short in addressing the true welfare benefits arising from the Natura 2000 sites.

In the context of revealing effectiveness, costs, and benefits of SEA, the review studies in the last decade, and even earlier, report on certain deficiencies of SEA and EIA, and provide general, mostly opinion based, information on the costs and benefits of formal environmental assessments (COWI, 2009; EC, 1996; EC, 2006; Institute for Environmental Studies, 2007; OECD, 2006; Sadler and Dalal-Clayton, 2010; World Bank, 2003). In this relation, however, it is important to stress the need for distinction between a (e.g., construction, infrastructure) project related CBA, monetization of the environmental quality with cost evaluation of the environmental impacts, and the CBA for SEA procedures. The former two are covered by an extensive literature, research and other contributions discussing various aspects of the topic, including their strengths and limitations (Asafu-Adjaye, 2000; Bockstael et al., 2000; Braden and Kolstad, 1991; Brennan and Eusepi, 2009; Canadian Cost-Benefit Guide, 2007; Clawson and Knetsch, 1966; Commonwealth of Australia, 2006; Constanza et al., 1997; Dixon, 2008; Dixon et al., 1994; Environmental Valuation I and II, 1999; Flyvbjerg, 2005; Haneman, 1992; Hufschmidt et al., 1983; King and Price, 2004; Kneese, 1964; Krutilla, 1967), while coverage of the third by any kind of literature, including case studies, is relatively poor. The report of the EC from 1996 examines the relative costs and benefits associated with the implementation of environmental impact assessment (EIA) and SEA in selected countries within the EU (note: in 1996, the SEA Directive was still not accepted, although strategic environmental evaluation was already in widespread use throughout the EC). Respondents in the survey identified some benefits of SEA – improvement of the basic strategic concepts of the P&P, enhancing P&P's contribution to the overall goals of environmental sustainability, enhancing transparency, etc. In the conclusion, the Study reveals that SEA is relevant at all levels of public decision making, and that the costs are generally borne by the public sector. It also reveals that SEA

is being used by organisations as a logical extension to their existing strategic planning processes.

In its study (Institute for Environmental Studies, 2007), the Institute for Environmental Studies presents the results of a review of existing studies that identify the costs and benefits associated with implementation of the EIA Directive. The costs of performing an EIA are mostly less than 1% of the overall (investment) costs of the project. EIA costs incurred by public administrations consist mainly of man-hours, which are often not specified. In some cases it is argued that delays are a major cost item. This survey has not encountered any studies trying to quantify or even monetize environmental improvement that can be attributed to the EIA process. Most/all benefits of EIA were not monetized but there is widespread agreement that the benefits outweigh the costs.

Fundingsland Tetlow and Hanusch (2012) assess SEA as a flop or a success story, since their study revealed mixed findings on its effectiveness. In some cases SEA has failed to live up to expectations but in others it has led to changes in P&P contents and to increased transparency. The authors recommend that SEA must become more strategic and must be integrated into the development and decision making of P&P.

The last study on the implementation of the Directive on SEA is based on a review of responses of the 27 EU Member States to the questionnaire concerning the application and effectiveness of the SEA Directive. As already mentioned, this study reveals problems related to the implementation of SEA in almost all MS (COWI, 2009). Costs reported on SEAs are mostly based on estimates and vary according to the type of plan and programme being assessed (ranging from €3.000 to €100.000). Most Member States either do not have reliable estimates of the costs of preparing the procedural steps of the SEA process, or claim that they have insufficient experience to provide an estimate. Some Member States acknowledged the benefits of SEA but they have not monetized them. The main conclusions about benefits and cost, based on these studies/reports, are: SEA is a bureaucratic process, ineffective and of minor importance in improving P&P; it increases time and money costs and, in only a few cases, contributes to environmental quality and safety and to increased public involvement. These conclusions, however, appear different from those recently presented by the researchers, who argue that SEAs contribute to plan improvement, environmental quality protection, and sustainable development (Arts et al., 2012; Fisher, 2003; Fischer, 2009; Impact Assessment and Project Appraisal, 2012; Morrison-Saunders and Fischer, 2009; Sadler and Dalal-Clayton, 2010; Therivel and Minas, 2002; Therivel, 2005; Van Doren et al., 2013). Based on all these studies it is difficult, or even impossible, to draw clear conclusions as to whether the benefits of the procedure exceed costs. Such a situation thus allows the conclusion that guidance provided by the EC on the methodology for carrying out cost-benefit analysis (EC, 2006), together with its purpose, has still to be accepted and applied by Member States. The Manual of European Environmental Policy (Institute for European Environmental Policy, 2011) emphasizes the importance of preliminary assessment of the cost and benefit of the policy, if introduced, and of their contribution to achieving the environmental and social objectives. This procedure is called Impact Assessment (IA), not CBA, but it is clear that CBA is part of such an assessment (EC, 2005).

Due to such an unclear and mixed situation throughout the EU regarding the costs and benefits of SEA it has been decided that the issue should be more thoroughly investigated in Slovenia. Organisationally this has been performed in the framework of a targeted research project. The study covers two case studies – one the SEA process for the bypass around Škofljica, the other a strategic spatial development plan for the city of Ljubljana. In addition, three workshops on the praxis and weaknesses of SEA in Slovenia, together with a survey on the same topic made among Slovenian spatial planners, conductors of environmental reports and representatives of the authorities involved in the SEA processes have been performed.

Basis for the CBA on SEA – a plan for a traffic bypass around Škofljica

About the plan and related SEA

The case study refers to the plan for constructing a bypass around Škofljica, a town near Ljubljana. Daily migration from E and SE Slovenia towards Ljubljana causes congestion on the highways and other national roads leading to the city. The main problem is at peak hours on the Dolenjska road that connects Ljubljana with Kočevje (Fig. 1). The worst traffic conditions are in Škofljica itself. In order to solve the problem, the Ministry of Transport submitted a proposal for a bypass to Škofljica in January 2005 (Official Gazette No. 74/2005). According to the national SEA legislation (Official Gazette No. 73/2005) this proposal triggered the formal SEA procedure for the plan.

The objectives of the plan were to ensure appropriate internal and external links for traffic from the region of Kočevje to the highway system around Ljubljana, consequently improving the traffic flow in Škofljica (Government Office for Development, 2006; UMAR, 2005). There were also expectations in terms of improved traffic safety. Environmental goals were defined as achievement of compliance with regulation (norms, standards). Concrete needs and goals of SEA in the context of the plan were not determined. Scoping for the ER at this stage did not expose any specific environmental issue.

Initially, three alternatives, – A, B, and C – with total lengths from 5 to 8 km, were proposed for the bypass (Fig. 2a). A detailed analysis during 2006 revealed that all three conflict with the Natura 2000 site Ljubljansko Barje, an area important for the butterfly species *Coenonympha oedippus* and for bird habitats, with the natural value of Jelšje, and with a cultural monument – a heritage from the Roman age (GEATEH, 2007; PNZ, 2006; Urbis, 2006). In addition, each alternative occupies a considerable

proportion of the agricultural land in the municipality of Škofljica – from 25 to 40 ha, depending on the alternative – for which the Ministry of Agriculture requires compensation in terms of agricultural land elsewhere – as a mitigation measure in the context of natural resource protection (note: the Ministry of Agriculture is a formal participant in SEA). Consequently, the Institute for the protection of nature, the Institute for the protection of the cultural heritage of Slovenia, the Ministry of the Environment and Spatial Planning with Sector of SEA, and the Ministry of Agriculture (note: the organisation of the ministries in 2006 was different; since in 2011 the Ministry of Agriculture and the Ministry of the Environment were merged into the Ministry of Agriculture and Environment) required the development of an alternative outside the area of Natura 2000, distant from the cultural heritage, and with only minor impact on agricultural land. After almost a year, planners came up with a new alternative, D (Fig. 2b), which has been further fitted to spatial conditions together with optimised alternatives A, B, and C, none of which, however, completely avoids the Natura 2000 site or agricultural land. At this stage the alternatives were renamed as alternatives 1, 2, and 3 (Fig. 3).

Further consideration of the alternatives was controversial. Comparative studies made in the period of 2007–2012 were ineffective in terms of identifying the best feasible alternative (Dnevnik, 2012; PNZ, 2007, 2010; Urbis, 2007b, 2008). Revised ERs also failed to contribute to the solution (GEATEH, 2010). Political pressure by various parties, such as the Civic initiative of Škofljica, and the Society of 12 mayors from the Kočevje region, which requested a decision directly by the Government of Slovenia, were also without practical response. The only result of all these efforts was the further attempt to optimise the alternatives, as presented in Fig. 4: Alternative 1 was changed to 1A, alternative 2 to 2A and alternative 3 was rejected due to functional inadequacies and resistance of the Civic initiative of Škofljica. An additional, alternative OC

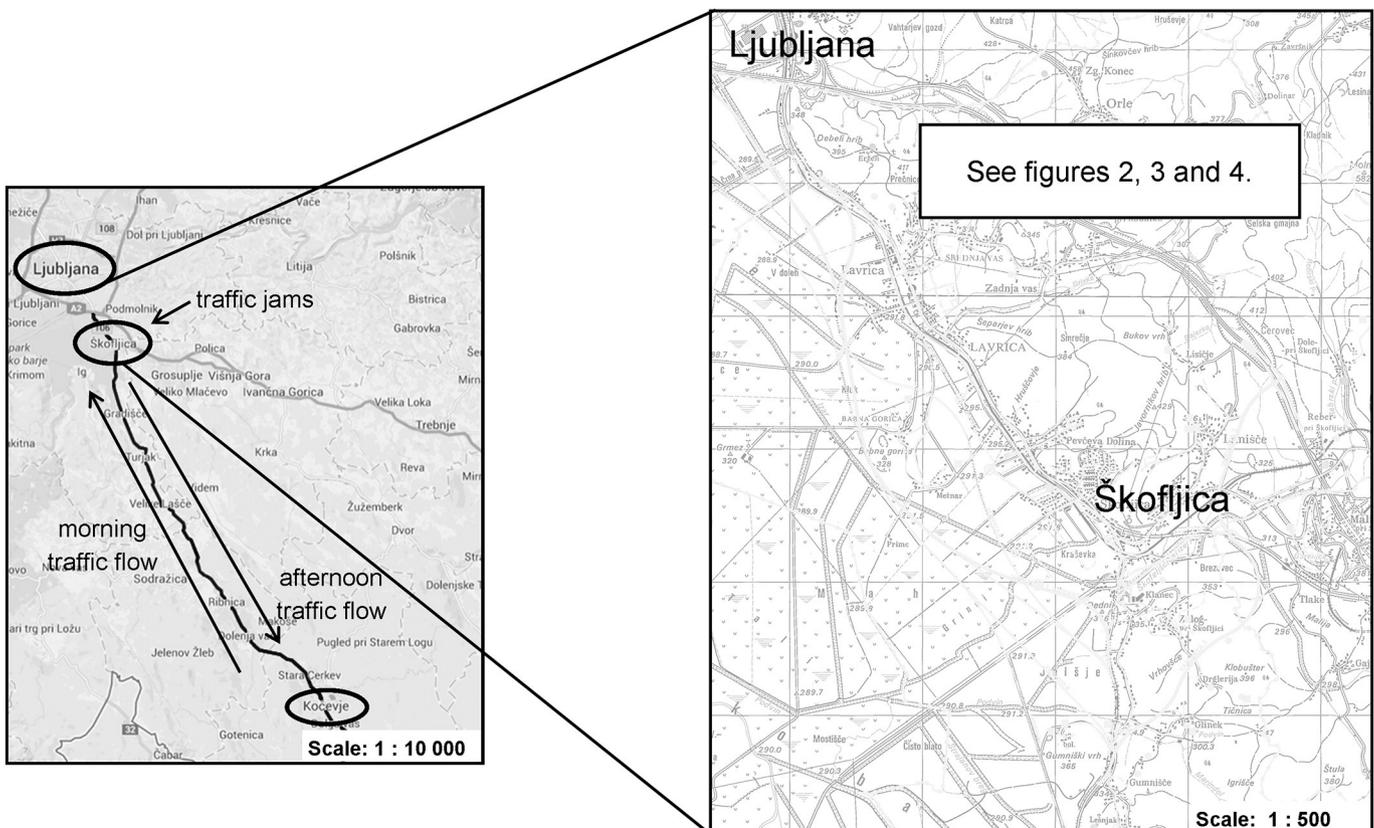


Fig. 1. General orientation.

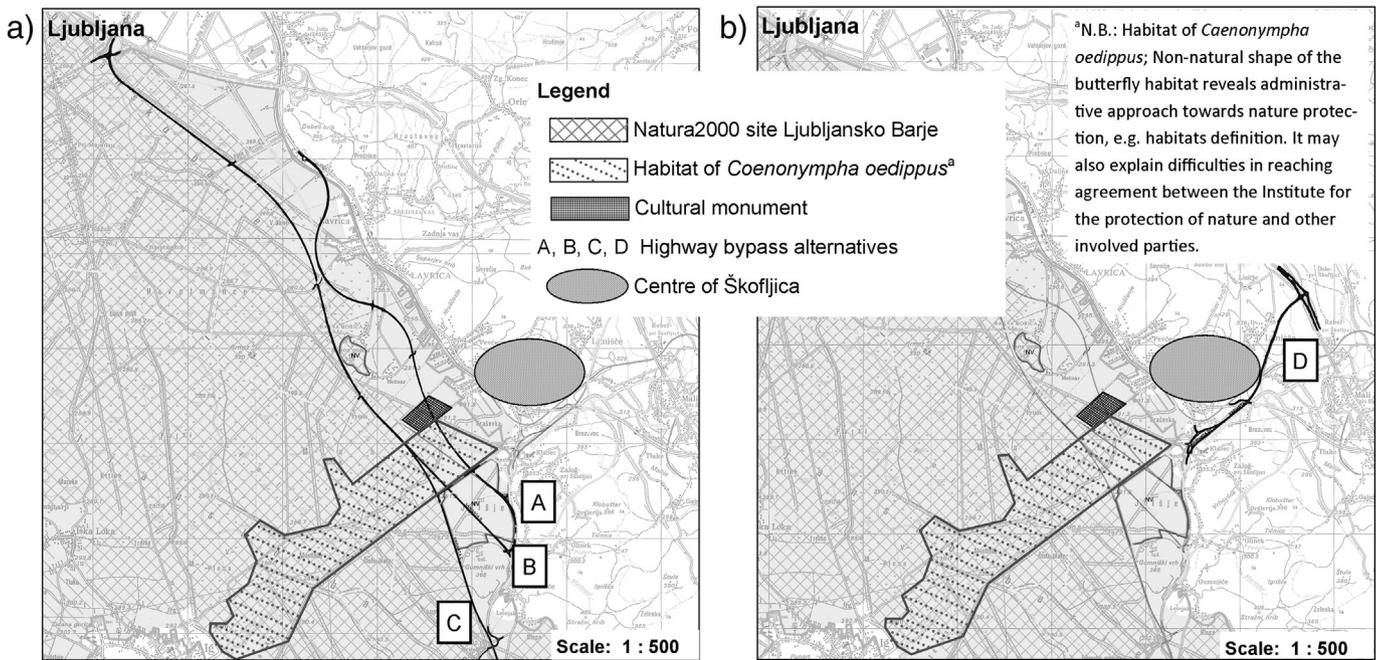


Fig. 2. a) Alternatives A, B and C; b) alternative D.

was proposed, although it was rejected by the mayor of Škofljica, on the grounds of being in conflict with the long-term spatial development plan of the municipality. In November 2012 the SEA process was “frozen” without any final decision or clear explanation. In spring 2013 the Society of 12 mayors tried to “push things forward” and mobilise the Government of Slovenia to reach a decision, however again

without success. This was then the basis and motivation for a cost-benefit analysis (CBA) of this particular SEA process. The key inputs for this analysis were:

- Alternatives 1A and 2A as subjects of the analysis; the other two had been rejected as explained above;

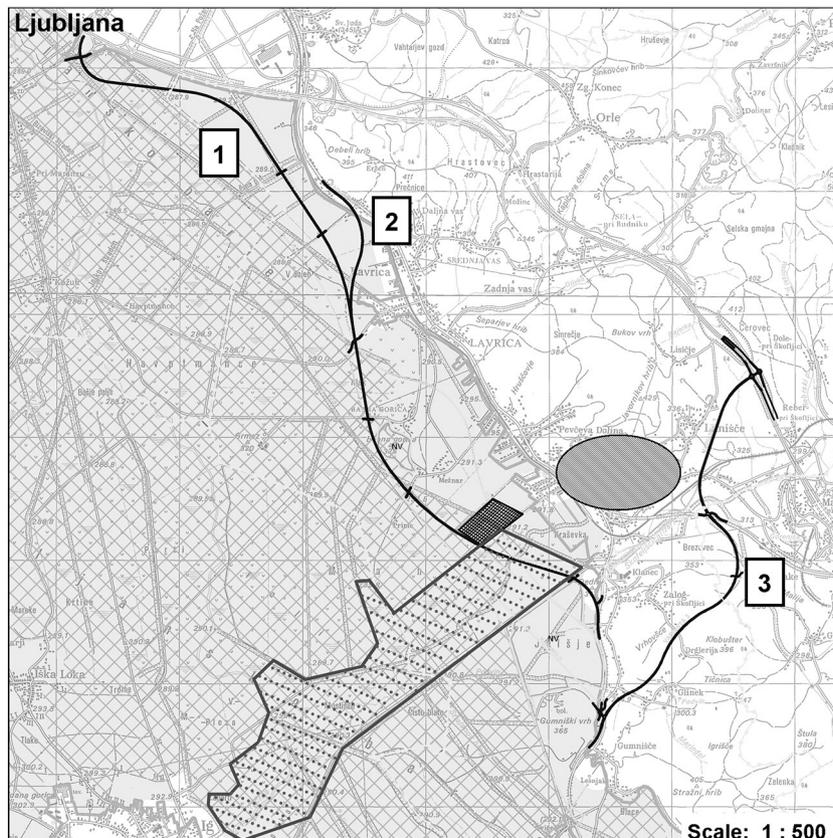


Fig. 3. Alternatives 1, 2 and 3.

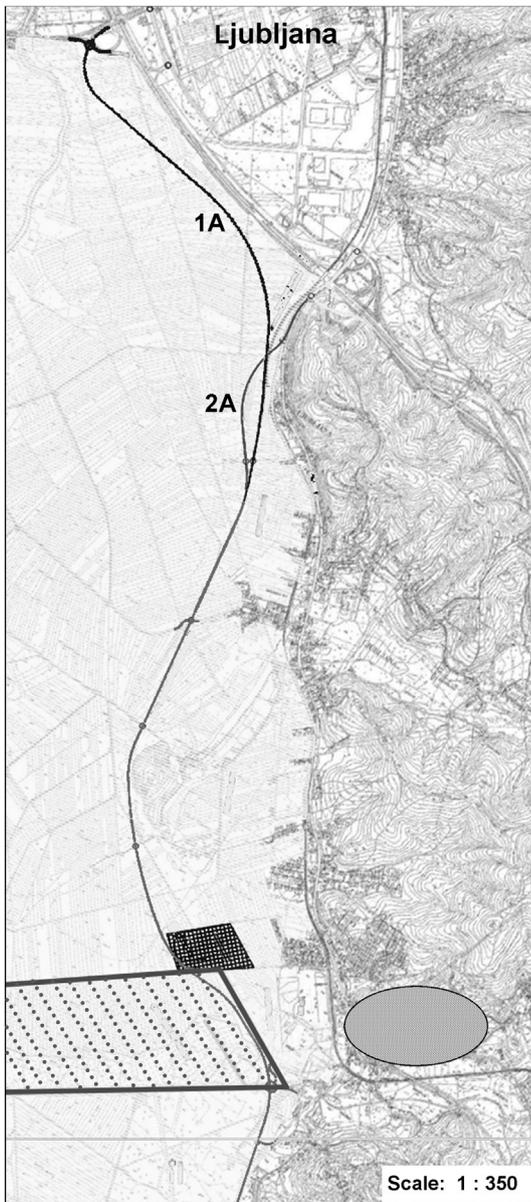


Fig. 4. Alternatives 1A and 2A.

- Both alternatives were in conflict with the Natura 2000 site and the agricultural land;
- Requirements for the mitigation measures had concentrated on establishing alternative habitats for the butterfly species *C. oedippus*, the natural value Jelšje, the populations of bird species, e.g. *Vanellus vanellus*, *Scolopax rusticola*, and *Motacilla flava*, and the agricultural land, altogether up to 517 ha for alternative 1A, and 406 ha for alternative 2A (around 40 ha due to direct impact, and 290–370 ha for indirect impact – i.e. disturbance of wildlife). The factors applied in defining the extent of alternative habitats due to the loss of existing areas on implementing the plan were 1.4 for the bird habitats (King and Price, 2004; Reijnen et al., 1995), 3 for the butterfly species (King and Price, 2004) and 1 for the agricultural land.

The general perception of the issue in the country at this stage, presented and supported by the media, was that the whole society/nation has become the hostage of biologists/ecologists and SEA bureaucrats who have usurped political power for establishing their own particular interests, and that SEA does not coordinate societal interests at all but rather supports nature protection fundamentalism – that birds and

butterflies are more important than wider economic and social welfare interests, including public health (note: during this period there were also other conflicts between nature protection interests and public health interests. For example the number of bear attacks that resulted in fatal and major injuries made no impact on the existing, rather extreme policy on bear protection). As a consequence, it was widely felt that, after 8 years of bureaucratic and incompetent administrative work on this particular SEA, the huge amount of money (presumed to be ~60% of the plan implementation value) is to be wasted on non-justified habitat creation/restoration, maintenance and monitoring of habitats and bird/butterfly populations, as well as on the reestablishment of agricultural land, at a time when the general attitude in the country allows afforestation of agricultural land as a consequence of both low economic efficiency of agricultural practice and its lost social impact/value. An additional, strong contribution to such a general understanding provided a “common sense” reflection on the shape of the butterfly species *C. oedippus* habitat, as presented in Fig. 2. To a major extent it is a combination of straight lines, very unusual in nature, geometrically avoiding the cultural monument. This proves the administrative character of the nature protection approach through Natura 2000 (see also N.B. comment in Fig. 2), which should be abandoned.

About the CBA approach

Asafu-Adjaye (2000) cited that the first formal application of CBA was in 1768, made to evaluate the benefits of the Forth-Clyde canal in Scotland. On the other hand a French journal for economics reports that the idea of CBA first appeared in 1844, when the French economist and engineer Jules Dupuit strove to define a maximum bridging tool (Dupuit, 1995, published in *Revue Française d'économie*). Its application on broader public policies started in 1958 when Otto Eckenstein (1958) laid out a welfare economics foundation for CBA and its application for water resource development. During the 1960s the concept of option value was developed. CBA was later expanded to address both tangible and intangible benefits of public policies. In 1969 the National Environmental Policy Act first required the application of CBA for regulatory programs. Since then other governments have enacted similar rules. Since 1960 environmental movements have influenced an increasing awareness of environmental economics or, more broadly, environmental management and development. Today all these themes are still important. Polluters Pay Principle can be interpreted as the beginning of the first formal attempt to properly distribute social relevant costs and benefits.

CBA is today recognized as an important tool for policy design and decision-making. However, there is a need to emphasize social desires and the tendency towards better environmental protection and adjusted development, rather than the necessity to ensure compliance with the EU law – the SEA Directive. According to this, CBA can be used to analyse the SEA procedure, using an approach similar to those for other activities (investments, projects, etc.). In principle, the positive impact of the SEA procedure is interpreted as being the benefit and the negative impact as cost. The aim of selecting the CBA for the case study was to determine the positive impacts of SEA on the environment and sustainable development on one side, and the operational costs of the process on the other.

In the CBA for SEA it is important to distinguish the costs and benefits of the SEA process from those of the plan (Fig. 5). Confusion can arise when considering costs for the mitigation measures required in the SEA process. These costs are often transferred to the plan costs, usually without proper justification, and are not clearly attributed to SEA. They are simply perceived/accepted as a legal requirement without questioning their logic. Eventually, in public investments, this means imposed costs to the society as whole. Regarding benefits, the potential for confusion is similar, and is associated with environmental improvements, which are to be attributed to the SEA process. Conceptually, these benefits/improvements should be beyond those that can be achieved by

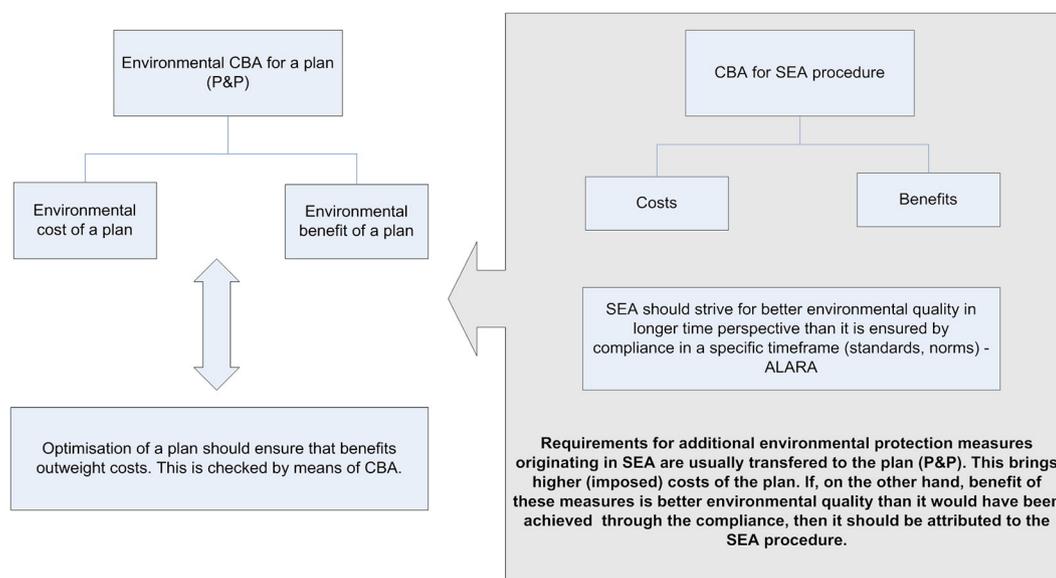


Fig. 5. Links between CBA for SEA and CBA for a plan (P&P).

compliance to other, general and specific, environmental regulation. If this is not the case, i.e. if SEA does not contribute to environmental improvements beyond other modes of regulation, then is it unnecessary or redundant. In other words, when performing CBA for SEA one should look for the difference/improvement in environmental quality made between when SEA is carried out and when it is not. After combining costs and benefits, the latter should exceed the costs – the B/C ratio should be greater than 1.

Although it is imperative to make a quantitative CBA, environmental CBAs are mostly semi-quantitative. The main reasons for the incomplete assessment of certain costs/benefits are usually lack of data and

complexity of the evaluation. A selection of examples of this issue is presented in the World Bank report (World Bank, 2003).

Table 1 provides an insight into categories of costs and benefits of SEA for the Škofljica bypass. Direct costs relate to the legally obliged procedure, documentation, events and participants in the procedure, and plan optimisation. Indirect costs relate to expenses or lost (financial) benefits in the case of delays in the decision-making process, which may occur due to the inefficiency of the SEA process (e.g. delays in the realization that the municipal spatial plan leads to investment delays and loss of expected funds/resources in the budget of the municipality; such indirect costs are transferred from SEA procedure to the municipality), and the continuation of the traffic problem with related health issues. Benefits, on the other hand, are more general and are more difficult to quantify.

Table 1
General overview of categories of costs and benefits for SEA – Škofljica bypass.

Costs	Benefits
Direct	
Costs of plan optimisation (comparison of alternatives, development of new alternatives) – this may overlap with the amount of time spent on SEA	Improved plans, selection of best option, optimisation of land use, higher efficiency of approval procedures, rational plan implementation including reasonable selection of the mitigation measures
Time spent on SEA (document reviewing, issue of guidelines, linking with spatial planning, coordination meetings, etc.)	Nature, agricultural land, culture heritage conservation (protection above standards and norms, ALARA ^a principle, value of environmental quality which exceeds mitigation measures inputs/ costs)
Preparation of expertise in the context of SEA	Reduced pollution, better public health – lower costs, lower exposure (in addition to what is already provided by the plan)
Indirect	
Delays in investments by the municipality of Škofljica	Democratic process, wider participation of stakeholders
Continuation of traffic problems (longer travel times – congestions, air pollution, noise, safety)	Raising awareness on environmental protection and sustainability
Continuation of public health impact and related costs	Efficient municipal spatial planning, transparent and justified decision-making

^a ALARA – As Low As Reasonably Achievable; environmental impacts should be as low as possible, using the optimisation approach, comparison of alternatives and selection of the best, application of BAT – Best Available Techniques, facing development and protection interests, etc. Regulation, per se, does not provide the best, state-of-the-art solutions in longer timeframes but rather a compromise adopted at a particular point in time.

Assessment of costs and benefits of SEA for the Škofljica bypass

Data were extracted from the available documentation (different versions of the plan for the bypass, studies on traffic development, ER, etc.) and by means of three different ways of communication with the involved parties in SEA: 1) by e-mail (filling the questionnaire), 2) phone interviews, and 3) personal contact for the purpose of elicitation of opinions (workshops, individual meetings). Not all contacted persons/institutions responded; the main missing data are, surprisingly, from the Sector for SEA, which is responsible for conducting and coordinating the SEA procedure.

Collected opinions can be summarised as follows: (a) they are contradictory (employees of the Sector for SEA are mainly satisfied with the SEA procedure, while others are less or not at all satisfied); (b) the SEA processes should be improved, especially at the initial stages (scoping, development and comparison of alternatives); (c) some respondents argue for radical change of the process and movement from the approval context to integration with planning; (d) formal requirements by the representatives of public offices/institutions, e.g. Institute for Nature Protection, related to mitigation measures should be justified; (e) increased competence of the participants in the SEA process is needed (e.g., providers of ER, proponents of the mitigation measures, employees of the Sector for SEA); (f) the process should be less bureaucratic.

Table 2 provides an overview of direct and indirect costs and benefits for the Škofljica bypass, while an insight into the process of monetisation is given in Tables 3, 4, 5, 6, 7 and 8. It is important to

Table 2
Overview of direct and indirect costs and benefits of SEA for the Škofljica bypass.

Cost category	Value (€)	Comments	Benefit category	Value (€)	Comments
Direct			Direct		
Time spent on SEA	Between €140,000 and 160,000	Not all contacted parties provided data – the costs are consequently underestimated	Improvement of plans, selection of best alternative, optimised land use, environmental protection above standards and norms, reduced pollution, lower costs of accidents, etc.).	–	Potential savings on the shortest travel times, reduction of pollution and lower costs of accidents, which are now represented as indirect cost, can be interpreted as direct benefits of SEA procedure if the result of SEA is selection of the best alternative.
Preparation of studies/ documents in the context of SEA	Between €420,000 and 440,000	The planner bears the costs			
Indirect			Indirect		
Delays in investments by the municipality of Škofljica	€100,000	Estimated by the municipality staff	ER contributes to the search for new alternatives and optimisation, discussion meetings are beneficial, SEA procedure is/not fulfilling goals of environmental protection, mitigation measures are/not appropriate, public offices which participate in SEA contribute/do not contribute to plan improvements in terms of environmental protection, etc.	–	Indirect benefits are expressed during interviews – opinions are mixed, sometimes contradictory
Longer travel times – congestion	Costs are between €1.1 and 7.2 million per year	Calculations were made for cars, buses and freight transport based on the data on traffic on the Ljubljana–Škofljica road from year 2005 to 2011.			
Costs of pollution	No congestions – savings from €90,000 to 180,000 per year ^a 50% reduction of congestions – savings from €45,000 to 90,000 per year	Costs were calculated for cars, buses and freight transport. Zhang et al. (2011) suggests 20–50% reduced emissions by moving traffic. If the Škofljica bypass will be constructed these costs can be interpreted as potential benefits of the SEA procedure.			
Costs of mitigation measures	Habitat creation/restoration – €52 to 77 million	Since the SEA procedure has not been concluded, these costs are open, and it is not appropriate to attribute them conclusively to SEA. However, if the mitigation measures will be carried out, then their costs will become costs imposed by SEA.			
Costs of traffic accidents	€110.000–1.285.000 per year	These figures were obtained from the accident statistics for 2008 to 2011. ER has not evaluated as to how much the number of traffic accidents would be decreased if the bypass were to be constructed, so differences in costs, i.e. savings, are not available. Only qualitative interpretation is possible at this stage. For example, savings are expected due to better traffic safety on the Ljubljana–Kočevje road if the Škofljica bypass is constructed.			

^a Figures could be higher when considering reduced emissions of heavy metals, VOC, etc....

Table 3
Relation of CBA to ER and SEA.

Process and analytical components of CBA	Relation to ER and SEA; focus of consideration
Process	ER provides an overview of environmental protection and sustainability goals related to the plan. It shows which goals are to be achieved by the plan, i.e. the Škofljica bypass, and which are to be attributed to the SEA process. Regarding potential environmental impacts, the report justifies how they will be mitigated/avoided. Special attention is paid to the environmental protection measures that are required by the SEA process; quantification of the expected reduced impacts and the efficiency of mitigation measures are imperative. <i>Note:</i> Items are to be monetised only for those environmental improvements and goals that can be attributed to the SEA process. In this context, ER for the Škofljica bypass was not clear, so monetisation was not possible for the whole set of expected improvements.
Analytical	The basis for monetisation is standard, comprising case specific methods and approaches, e.g., direct and indirect methods, contingency evaluation – willingness to pay (WTP), willingness to accept (WTA), etc. <i>Note:</i> WTP for alternate habitats has not been performed since these were justified as legal requirements, which do not demand additional justification in terms of CBA.

note, however, that this overview is limited, since it does not include all the information about the bypass plan and background analysis. Most of the documentation from which data have been extracted for the CBA is only cited in this paper. Again, the information presented here does not deal with applied factors of monetisation of different categories, e.g. value of time lost, value of hours driven by a type of vehicle, value of specific pollutant emissions, etc. – only reference to the sources of these factors is provided. The issues associated with prices and purchase agreements/contracts for land acquisition for either of the bypass alternatives, as well as alternative habitats, deserve proper attention since they contribute significantly to the overall costs. The space available for this paper is, however, limited so only a fraction of the statistics on the traffic through Škofljica is provided. For example, there are no data on the quality of vehicles in terms of pollutant emission, occupation of the vehicles during trips, actual duration of traffic jams, etc. The urban situation in Škofljica, with trends for future development (long-term municipal spatial plan), which are relevant for evaluating the exposure to noise and air pollution – i.e. public health issues in relation to traffic – is also not discussed. Similarly, comprehensive information about possibilities of other modes of transport between Kočevje and Ljubljana – which contributes integrally to the overall picture of the need for the Škofljica bypass – e.g. the status of public transport (train and buses), P+R system, car-sharing and car-pooling, etc. is not provided in this paper, although it is described in the report on public transport in the

Table 4
Monetisation values for different categories in traffic Bickel et al. (2006).

Vehicle	Value per hour driven (€)	Pollution		
		CO ₂ (average) (€/t)	NO _x (€/t)	PM ₁₀ (€/t)
Car	18.80 (business) 8.04 (non-business)	25	9.578	48.320
Bus	15.08 (business) 5.78 (non-business)	Noise (€/person/year) dB(A) 69–73	Safety Death (€)	Injury (€)
Truck	18.80 (business)	141–221	1,028,000	133,500

€/t – Euro per tonne.

Table 5
Average number of vehicles passing through Škofljica.

Year	Average number of vehicles per day		
	Cars	Buses	Trucks
2005	15,414	170	1586
2006	16,207	169	1724
2007	15,978	166	1894
2008	16,013	169	1987
2009	16,674	157	2011
2010	16,103	172	1873
2011	16,280	183	1938
Average for the period	16,095	162	1859
Number of vehicles in peak hours (20% of daily average)	3,220	32	372
Annual number of vehicles in peak hours	808,220	8032	93,372

Ljubljana Urban Region (Regional Development Agency for Ljubljana Urban Region, 2010).

Discussion

The SEA process was costly and almost without tangible benefits (Table 9). Despite the fact that the B/C ratio could not be specified/quantified at this stage of the process, due to uncertainties related to both direct and indirect benefits of SEA, it is clear that the ratio is far below a value of 1.

Further interpretation of results calls for special attention about the following:

1. *Mitigation measures.* The process of costing mitigation measures, which contribute significantly to overall costs, was not transparent and does not appear to be rational, so its social acceptability is doubtful. No alternatives to the mitigation measures were considered, which raises questions about the credibility and competence of the proponents, especially the Institute for nature protection and the Ministry of Agriculture. Numerous comments, critiques and expert responses during the last seven years were sent to representatives of the parties formally involved in the SEA procedure. The topics were costs of habitat creation, compensation of agricultural land, costs of cultural heritage protection, purpose and rationale of monitoring the effectiveness of alternative habitats, coupled with the key questions: “Should other, alternative, habitats be established somewhere else, if the first ones prove ineffective after five years of monitoring, and what will happen with butterfly species and birds in the meantime?”, “Should another €77 million be spent in this case?”, “Do we need a SEA process that generates such costs

Table 6
Annual value of the time lost due to traffic jams in peak hours.

Vehicle	Ride	Number of persons	Annual costs (€)		
			5 min traffic jam	15 min traffic jam	30 min traffic jam
Car	Business	80,822	121,233	379,865	759,731
	Non-business	1,078,165	690,025	2,167,111	4,334,223
Bus	Business	7245	8766	27,313	165,982
	Non-business	354,195	162,929	513,582	1,023,623
Truck	Business	93,372	140,058	438,848	877,696
Total			1123,011	3526,719	7161,255

Note: The figures provided above were derived by adding time lost for all involved in the traffic jams, taking into account available statistical data on the types of vehicles involved, purpose of the trips – business and non-business, occupation of the vehicles, etc. The applied value factors were €18.80 per business hour lost, and €8.04 per non-business hour lost.

Table 7
Costs arising from air pollution.

	Kilometres driven in 2011	Fuel	Annual emissions				Cost of air pollution (€/year)					
			CO (t)	CO ₂ (t)	NO _x (t)	PM ₁₀ (t)	CO	NO _x			PM ₁₀	
								Low	Medium	High		
Cars (EURO 4)	32,690,240	Gasoline	32.7	5557.3	2.6	–	–	38,901	138,932	250,078	24,903	0
	32,690,240	Diesel	16.35	5230.4	8.2	0.82	–	36,613	130,760	235,368	78,540	39,622
Buses	734,928	Diesel	1.6	848.3	3.45	0.095	–	5938	21,207	38,173	33,044	4590
Light trucks (EURO 3)	5,204,736	Diesel	4.9	1249.1	3.1	0.36	–	–	–	–	29,692	17,395
Average trucks (EURO 3)	827,296	Diesel	0.786	–	0.645	0.7	–	–	–	–	6178	33,824
Heavy trucks (EURO 3)	887,536	Diesel	1.86	–	4.4	1.12	–	–	–	–	42,143	54,118
Sum							–	81,452	290,899	523,619	217,500	149,549
Total costs (existing situation)							–	448,500–890,670 (variation according to CO ₂ emission)				
Total costs – assuming 50% reduction after bypass construction							–	200,000–450,000 (rounded)				

and attitudes?” Clear answers to these questions, including from the Government, are still awaited.

II. *Economic and other damage to the communities.* Unanswered questions about costs/damages relating to directly affected communities remain, because the Škofljica bypass has not yet been constructed. The Municipality of Škofljica has recently decided to solve the problem as part of a revised municipal spatial plan. The main reasons are, first, to attempt to reassure the citizens of the community that a satisfactory solution to the problem will be reached, making their quality of life better and, secondly, to avoid further costs incurred by the SEA procedure associated with freight transport to the industrial zone. The revised spatial plan therefore defines reconstruction of the railway between Kočevje and Ljubljana and the establishment of a P+R system in Škofljica (Struktura, 2011) as key priorities in the context of a long-term solution of traffic issues in Škofljica. The new plan also assumes a new service road to provide access to the industrial zone from the Kočevje direction.

III. *Level of planning the Škofljica bypass.* It is obvious that the planning for a Škofljica bypass – a length of up to 8 km – has been carried out at a low strategic level – in fact at a project level. Consequently, the SEA process was something of a mixture of EIA and SEA considerations, with the emphasis on details, which do not solve the key issues. If a real strategic treatment of transport issues were applied, it would lead to the development of alternatives that include resolution by means of transport intermodality and by combinations of transport infrastructure such as a P+R system and railway connections with public transport on the regional level. The appropriate approach is clearly presented by e.g., Fischer (2006), the EC (1999, 2004, 2008), and Spellerberg (1998), however the problem seems to be a lack of specific regulation, which would set the clear criteria, for example, when to treat a specific road section as a transport infrastructure plan which would need SEA, and when it should be treated as a project, which requires the application of an EIA. Without such criteria the Slovenian SEA administration will continue to oscillate in its decisions as to which environmental assessment to apply in a particular case. This is particularly surprisingly knowing that the practice of environmental assessment (EA), which includes strategic evaluation,

started in Slovenia in 1972 (Kavaš et al., 2003; Kontić, 2000, 2001). Since 2005, when SEA was formally introduced in Slovenia, there have been hundreds of SEA procedures performed for various plans and projects (land-use, water management, agriculture, forestry, energy, waste management, transportation infrastructure plans, national development plans, etc.). However, the procedural part of SEA is still struggling with a number of issues (Mlakar et al., 2011, 2012), one of them being the need for differentiation between EIA and SEA in the context of deciding when to apply the first and when the second.

IV. *Uncertainties.* A number of sources of uncertainties are implicit in the definition and calculation of costs and benefits of the SEA categories. In analytical terms, important uncertainties may be found, associated with monetisation factors and the approaches/methods for establishing monetisation for inherently environmental values, despite their market presence and relevance. A sensitivity analysis based on variation of these values could bring better insight into the issue. However, the authors believe that the key uncertainty, in terms of how to reach a decision about the plan for the Škofljica bypass, and all the other development proposals, which influence the Natura 2000 sites, is related to the approach of nature conservation. It appears that Slovenia is at the point where the SEA process should be reconsidered and revised.

The presented case-study exposed a general problem of misusing SEA for fundamentalist nature protection in Slovenia (Kregar, 2014; Marušič, 2013), but what is less well known in this association is the inappropriate nature of the link between EA and environmental protection system enforced by means of the legal framework. Namely, the scientific information produced in the phase of EA is often presented in a way such that initially politically neutral scientific data on e.g. characteristics of the habitats, flora and fauna, are intermixed with the values and goals of a particular stakeholder, most often biologists. This additional and intermixing information is usually about species rarity, threats, etc. with suggestions about the protection and management measures needed. Despite these distorted, sometimes even manipulative presentations of the habitats' characteristics and their state, the information is still defended as a credible scientific ground for decision-making. This is an issue that was recognized decades ago by a number of authors, the first being Nobel prize winner Herbert A. Simon, Paul Taylor, and Nigel Taylor (Simon, 1977; Taylor, 1980; Taylor, 1986). They discuss facts and the role of ethics in environmental decision-making. The latter two, in addition, argue that scientific information on a specific species or habitat does not, in itself, contain the information about what to do with the habitat or the species, i.e. whether and how to protect/manage it. When it comes to making decisions, information about environmental management, as a policy issue, is more related to societal values and goals (ethics) than to biological or other scientific data. Misunderstanding and misinterpretation in this context is complete when the legal system (norms) defines which nature

Table 8
Costs of alternative habitats (summary).

	Alternative 1A	Alternative 2A
	Costs (million €)	
1. Arrangement	3.25	2.55
2. Land acquisition (purchase)	73.90	57.99
3. Monitoring & management	Between €24,000 and €35,000 per year; different for each alternative and habitat	
Total	77.15	60.54

Table 9
Synthesis of CBA findings for SEA for the Škofljica bypass.

Benefits		Costs		Ratio B/C; comments
Direct	Indirect	Direct	Indirect	
Part of the indirect costs relating to additional mitigation measures, e.g., establishment of alternate habitats, could become direct benefits if the habitats are effective in terms of providing better environmental quality/value than before, and if these are beyond compliance standards and norms	These benefits are real, but their assessment is qualitative. General benefits of SEA are, for example, contributions to democracy and participation	Partial figure is €440,000	Annual value of the time lost due to traffic jams and prolonged pollution is around €7.4 million; The maximum value of alternative habitats is €77 million	Costs significantly exceed benefits; poor achievement of the process; the procedure is costly

characteristics/state are to be protected (e.g. Natura 2000), formulates this in scientific language, and then establishes a system of checking (monitoring) whether this state is maintained. It is not difficult to conclude then, that this kind of monitoring can be performed only by selected scientists, i.e. those, who were engaged in the determination of such an integrated EA and protection system. In terms of Natura 2000 these scientists are obviously biologists/ecologists. From this point of view the administrative work on SEA appears as servility to nature protection fundamentalism.

Conclusion and proposals

The case study on CBA for an SEA procedure for the Škofljica bypass justifies the need for the following procedural improvements of SEA:

- CBA for SEA should become a regular component when measuring its effectiveness.
- Concretisation of expected SEA inputs to the plan should clarify its role at the earliest stage of the process.
- SEA should contribute interactively to the optimisation of alternatives; cost–benefit analysis of the SEA process could support this process.
- Nature protection interest should be confronted and balanced with wider development interests as formulated in the plan and should not be applied in absolute terms (e.g. Natura 2000).

With regard to the latter one should note the following: approximately 40% of the territory of Slovenia is under the Natura 2000 protection regime. Instead of being of similar weight to other factors in considerations of land-use planning, the philosophy and stringency of nature protection, in the form of Natura 2000, actually override all other factors. The consequence is that other uses of land are left to “find their place” on the residual 60% of the Slovenian territory. This is a significantly destructive, limiting factor, which supports non-creative rivalry between stakeholders. An additional unsatisfactory circumstance is that such an extreme understanding and practice of nature protection, that inhibits constructive consultation between stakeholders, has been enforced by law.

Acknowledgement

The research work has been financed in common by the Ministry of Agriculture and the Environment and by the National Research Agency of Slovenia, as a targeted research project on the effectiveness of SEA in Slovenia. The authors appreciate the reviewers' comments in the process of the peer review which improved the quality of the paper.

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