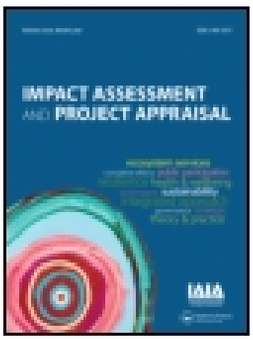

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Sustainability-focused impact assessment: English experiences

Riki Therivel, Gemma Christian, Claire Craig, Russell Grinham, David Mackins, James Smith, Terry Sneller, Richard Turner, Dee Walker and Motoko Yamane

This article considers whether strategic environmental assessment (SEA) of local-level spatial plans in England is leading to a high level of protection of the environment. It is based on an analysis of the sustainability appraisals (SA/SEA) of 45 core strategies, interviews with 14 planners, and 14 questionnaire responses. The findings suggest that the plans will have beneficial social and economic effects, but between mildly positive and mildly negative environmental effects. SA/SEAs act as an environmental counterweight to the plans' more social and economic focus, but have only limited effectiveness. They do not identify what type of development would be environmentally sustainable, nor what would be an acceptable trade-off between environmental costs and social/economic benefits; nor do they lead to environmentally sustainable plans. Significant changes in the SA/SEA and plan-making processes would be needed to deal with these problems.

Keywords: effectiveness, strategic environmental assessment, England, sustainability, impact assessment

THIS ARTICLE CONSIDERS whether strategic environmental assessments (SEA) of core strategies – the key spatial planning documents for English local authorities – achieve the objectives of the SEA Directive. It is relevant internationally because it discusses an approach to impact assessment that integrates SEA into a wider process of sustainability appraisal, which is seen by many as a 'next-generation' approach to SEA. The UK also has a strong tradition of land use planning, which is currently undergoing significant changes to become more spatially oriented, evidence based, sustainability led, efficient and participatory (CLG, 2008). SA/SEA is consistent with all of these principles (Verheem and Tonk, 2000; Partidario, 2000), and so should be helping to achieve cutting-edge sustainable planning practice.

The article begins by discussing the objectives of the SEA Directive and how they could be expected to apply in practice. It then discusses how SEA and sustainability appraisal (SA) have been integrated in England. It reviews the SA/SEA conclusion of 45 core strategies, and discusses the results of 14 interviews with planning officers responsible for SA/SEA

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and 14 questionnaire responses. It concludes with suggestions for improving the SA/SEA process in England.

SEA effectiveness

The SEA Directive (European Commission (EC), 2001) aims

> '(1) to provide for a high level of protection of the environment, and (2) to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes (3) with a view to promoting sustainable development' (Article 1, our numbering).

Clearly these objectives are not always mutually compatible. For instance, there may be times when sustainable development would allow for some environmental degradation to take place in order to achieve overriding social imperatives.[1] In other cases (e.g. greenhouse gas emissions), mere maintenance would be insufficient for sustainability (IPCC, 2007) and substantial rehabilitation and other steps to reverse current trends are needed. However, the sequence and wording of the Directive's objectives suggests that its main aim is environmental protection. This is confirmed by the European Commission's (EC, 2003) guidance on implementation of the Directive, which refers to Article 174 of the EC Treaty, which in turn states that:

'Community policy on the environment shall contribute to pursuit of the following objectives:

- Preserving, protecting and improving the quality of the environment
- Protecting human health
- Prudent and rational utilization of natural resources
- Promoting measures at international level to deal with regional or worldwide environmental problems' (EC, 2006).

The SEA Directive does not specify environmental limits/targets that plans are expected to achieve. Rather, it sets a series of procedural requirements that aim to achieve its objectives: preparation of an environmental report which describes the significant environmental impacts of a proposed plan or programme (see Box 1); consultation on the environmental report with environmental authorities and the public; 'taking into account' of the environmental report and consultation responses in the plan-making process; documentation of how the SEA process informed the plan-making process; and monitoring of the environmental effects of the plan.

Given the SEA Directive's objectives, environmental reports could also be expected to:

1. Identify what constitutes 'a high level of protection of the environment';
2. Identify the circumstances under which social and economic benefits may be allowed to outweigh environmental costs for the sake of sustainable development;
3. Inform the development of a range of alternatives for delivering the plan's objectives, and test them to determine whether they achieve 1 or 2 above; and
4. Ensure/show that plans take these findings into account, including a persuasive rationale for selecting the preferred alternative.

Box 1. SEA Directive Annex I requirements for the contents of an environmental report

a) An outline of the contents, main objectives of the plan, and relationship with other relevant plans and programmes;
b) The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan;
c) The environmental characteristics of areas likely to be significantly affected;
d) Any existing environmental problems which are relevant to the plan, including in particular those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;
e) The environmental protection objectives, established at international, Community or national level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation;
f) The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors. (These effects should include secondary, cumulative, synergistic, short, medium and long-term permanent and temporary, positive and negative effects);
g) The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan;
h) An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information;
i) A description of measures envisaged concerning monitoring in accordance with Article 10;
j) A non-technical summary of the information provided under the above headings.

The outcome one would expect from the application of the SEA Directive, and the test of 'effectiveness' used in this article, are plans that achieve a high level of protection of the environment or fully justify why such protection is not achieved on the basis of other sustainable development objectives.

Sustainability appraisal/SEA of English spatial strategies

In England, spatial strategies set the framework for development, and planning permission is required for most development projects.[2] Local authorities decide whether planning permission should be

granted for a proposed project based on the two levels of spatial strategy:

- Regional Spatial Strategies (RSS) – one for each of eight regions plus London – which set out a broad spatial strategy for how a region should look in 15–20 years' time; and
- Local Development Frameworks – one for each of the 387 English local authorities – which are folders of documents that outline the spatial planning strategy for the local area. Local Development Frameworks must include a 'core strategy' which sets out the general spatial vision and objectives for delivery.

This article focuses on SA/SEAs of core strategies. The development of a core strategy involves looking at different ways of achieving the spatial objectives set out in a sustainable community strategy developed by a partnership of local stakeholders, appraising these options and consulting the public on them. Once a draft core strategy is devised, it is published, consulted on, and then submitted to the Secretary of State for examination by an independent inspector to determine whether it has been legally prepared and is sound (CLG, 2008). Until mid-2008 (and for most of the core strategies analysed for this article), development of the core strategy typically involved preparation, assessment and public consultation on (1) an issues and options paper, (2) preferred options, and (3) a submission core strategy. Each of these was accompanied by an SA/SEA report. This process has now been replaced by a 'Regulation 25 process', whereby only three statutory bodies are consulted on the scope of the SA/SEA, followed by a more fluid plan preparation process that no longer requires the publication and assessment of options reports, and then a required stage of publication and consultation on the draft plan and SA/SEA.

Sustainable development is a statutory objective of the planning system (OPSI, 2004), and spatial strategies in England are expected to promote sustainable development:

> 'Sustainable development is the core principle underpinning planning…Planning authorities should ensure that sustainable development is treated in an integrated way in their development plans. In particular, they should carefully consider the interrelationship between social inclusion, protecting and enhancing the environment, the prudent use of natural resources and economic development' (ODPM, 2005a).

The Government's principles for sustainable development, which are expected to be 'pursued in an integrated way', are living within environmental limits; ensuring a strong, healthy and just society; achieving a sustainable economy; using sound science responsibly; and promoting good governance (HM Government, 2005).

Core strategies, some other Local Development Framework documents, and Regional Spatial Strategies require SEA under the Environmental Assessment of Plans and Programmes Regulations 2004 (which implements the SEA Directive in England) and 'sustainability appraisal' under the Planning and Compulsory Purchase Act 2004. Compared with the detailed SEA process set out in the SEA Directive, the latter is impressively vague:

> 'The local planning authority must also:
>
> (a) carry out an appraisal of the sustainability of the proposals in each document;
> (b) prepare a report of the findings of the appraisal.' (Regulation 19.5).

Because SA and SEA are both legally required, and because they have similarities and areas of overlap, Government guidance (ODPM, 2005b) promotes a joint SA/SEA process. This typically follows the SEA process but

- considers social and economic as well as environmental effects;
- uses 'SA objectives' to test the plan's impacts. These objectives are statements of what the plan should aim to achieve, for instance 'To improve people's health' or 'To reduce greenhouse gas emissions';
- involves heavy use of expert judgement, usually that of planning officers and/or their consultants, to test how well the plan achieves the SA/SEA objectives, with little use of modelling, quantification etc.; and
- involves consulting on a scoping report and an 'SA report' with a range of social, economic and environmental stakeholders, as well as the public (ODPM, 2005b).

SA has been described as being 'objectives led' and 'integrated', and SEA as being 'baseline led' and 'advocative' (Smith and Sheate, 2001; Kørnøv and Thissen, 2000; Fothergill, 2008). The move from SEA to SA/SEA can thus be seen as changing the focus from the current situation and problems towards the future situation and ambitions; and from raising the profile of environmental considerations in decision making, towards a more balanced integration of all aspects of sustainable development in decision making.

Methodology

This article considers whether SA/SEA of core strategies is achieving a more balanced integration of sustainable development issues in decision making. It is based on three main sources of data.

First, the SA/SEA reports for 45 core strategies were analysed, for five local authorities in each

English region plus London. Where possible, core strategies were chosen that had progressed to the submission stage by August 2008, and whose SA/SEA reports were on the Internet. No region had five of these. The remaining core strategies for each region were selected on the basis that (1) they had progressed to the issues and options stage, and (2) jointly with the first-choice strategies, they provided a mix of urban/rural and large/small authorities. Overall, 28 SA/SEAs for core strategy preferred options and 17 SA/SEAs for submitted core strategies were analysed. Three of the core strategies pertain to several local authorities each, and were written by consortia of the relevant authorities.

About half of the SA/SEAs were written between 2004 and 2006, and half in 2007 and 2008. Table 1 shows the SA/SEAs analysed.

The SA/SEAs' conclusions about the core strategies' impacts on 17 social, environmental and economic topics were compiled. These topics represented sustainability themes covered by the great majority of the core strategies' SA objectives, many of which were in turn based on regional sustainable development frameworks. The analysis was initially carried out by eight planning officers and consultants who were taking an SEA course at Oxford Brookes University, and subsequently cross-checked and confirmed by the course leader.

The SA/SEAs' conclusions represent predictions about whether the core strategies will help to achieve sustainability objectives, such as improving air quality or reducing economic disparities, not whether they will achieve sustainability *per se*. The scoring system shown in Table 2 was used to represent these conclusions. Where available (in about 40% of cases), the SA/SEA's summary table or cumulative impacts analysis was used. In other cases, an average score for the appraisals of the different core strategy objectives was determined. A few SA/SEA reports did not include scores, so these were inferred from the appraisal text.

Second, an attempt was made to carry out brief telephone or e-mail interviews with all of the planners whose SA/SEAs were analysed. Fourteen planners were finally interviewed: one each from the North West and Yorkshire and Humber regions, two each from the East of England and East Midlands, three from the North East, and five from the South East. The key interview questions were:

1. Do you feel that your core strategy is socially, economically and environmentally sustainable? If yes, what helped to make it sustainable? If no, what constrained its sustainability?[3]
2. How significant was the SA/SEA in ensuring that the core strategy was sustainable?

Finally, as part of a different research project, in July 2008 all 469 UK local authorities had been sent a questionnaire asking about various aspects of their SA/SEA process, and 151 had responded. Of the 151 responses, 14 were from local authorities whose SA/SEA report had been analysed for this research; some overlapped with the authorities interviewed, but most did not. These 14 questionnaires were also analysed for this article.

Limitations of the study include:

- The wide variability in levels of details of the SA/SEA reports, ranging from brief broad-brush statements to very lengthy, detailed analyses; and from very helpful cumulative impact assessments to a complete absence of conclusions. In some

Table 1. SA/SEAs analysed for this study

Region	Local authority	Plan version: submission (S) or preferred options (P)	Date of SA/SEA
East of England	Chelmsford	S	2006
	Great Yarmouth	P	2006
	South Cambridgeshire	S	2006
	Southend-on-Sea	S	2006
	Thurrock	S	2007
East Midlands	Ashfield	P	2007
	Blaby	P	2006
	Charnwood	P	2006
	Newark and Sherwood	P	2006
	North Northamptonshire*	S	2007
London	Hillingdon	P	2007
	Islington	S	2007
	Newham	P	2006
	Redbridge	S	2006
	Richmond	P	2007
North East	Castle Morpeth	P	2007
	Redcar and Cleveland	S	2005
	Sedgefield	P	2007
	Sunderland	P	2007
	Tynedale	S	2006
North West	Blackburn with Darwen	P	2007
	Eden	P	2005
	Lancaster	S	2007
	St Helens	P	2007
	South Lakeland	P	2008
South East	Ashford	S	2006
	Guildford	P	2006
	Horsham	S	2005**
	Oxford	P	2007
	Test Valley	P	2008
South West	Gloucester	P	2005
	Mid Devon	S	2006
	Penwith	P	2008**
	Poole	S	2008
	Swindon	P	2008
West Midlands	Black Country*	P	2008
	Shrewsbury and Atcham	P	2005
	South Worcestershire*	P	2008
	Stafford	S	2004
	Telford	S	2007
Yorkshire and Humber	Craven	P	2007
	Doncaster	P	2005
	Ryedale	P	2005
	Scarborough	P	2006
	Sheffield	S	2007

Notes: * Core strategy prepared by 3 or 4 local authorities.
** Date inferred from planning documents.

Table 2. Scoring system used for collation of data

SA/SEA appraisal score (or equivalent)	Meaning	Score given for this analysis
++	Very positive impact, very consistent with the SA/SEA objective	+2
+/++ or ++?	Between + and ++	+1.5
+	Positive impact, consistent with the SA/SEA objective	+1
+/0 or +?	Between + and 0	0.5
0 or +/– or no score	No impact, or roughly equivalent positive and negative impacts	0
–? or –/0	Between 0 and –	–0.5
–	Negative impact, inconsistent with the SA/SEA objective	–1
–/– – or – –?	Between – and – –	–1.5
– –	Very negative impact, very inconsistent with the SA/SEA objective	–2

cases this necessitated a judgement about what score should be given, based on the general tone of the SA/SEA. This had the potential for some subjectivity, but not to the extent that it would cancel out the rather striking findings discussed in the next section.

- The wide variability in how critical the SA/SEA reports were of the core strategies, without a similar obvious difference in the core strategies' impacts. The total appraisal scores for each core strategy over 17 criteria ranged from +21 to –5.5, presumably due largely to how the SA/SEA authors interpreted the impacts of a given policy.
- The fact that most of the SA/SEAs were only at the issues and options stage. This meant that the core strategies' full impacts could not yet be determined. The impacts of these early/draft core strategies may also not be representative of those of future core strategies.
- The relatively small sample of core strategies analysed – about 14% of all potential English core strategies – and of interview and questionnaire responses. The views of those planners who were willing to be interviewed, or willing to fill in a questionnaire, may not be representative of planning officers generally.

Furthermore, although this research criticizes some SA/SEAs on the basis that they focus on inputs/process rather than summarizing outcomes, the same criticism could also apply to this research, which essentially audits the SA/SEA process and not the actual impacts of the core strategies. To do the latter would require an analysis of several areas over time, before and after the adoption of the core strategy.

Table 3. Plan impacts on sustainability issues identified in the plan's SA/SEA report: average of conclusions of 45 SA/SEA reports (see Table 2 for marking system)

Sustainability issue: SA/SEA topic		All SA/ SEAs	SA/SEA for…		SA/SEA prepared in…	
			Preferred options document	Submitted core strategy	2004–2006	2007–2008
		n=45	n=28	n=17	n=23	n=22
Broadly social	Accessibility	1.27	1.20	1.38	1.41	1.14
	Crime	0.59	0.70	0.41	0.52	0.66
	Equity, inclusion	1.16	1.18	1.12	1.13	1.18
	Health	1.04	1.18	0.82	0.96	1.14
	Housing	1.23	1.21	1.26	1.28	1.18
	Average	**1.06**	**1.09**	**1.00**	**1.06**	**1.06**
Broadly environmental	Air	–0.21	0.04	–0.62	–0.26	–0.16
	Biodiversity	0.26	0.34	0.12	0.33	0.18
	Climate change, energy	0.09	0.38	–0.38	0.00	0.18
	Landscape, historical	0.67	0.63	0.74	0.72	0.61
	Resources	0.20	0.29	0.06	0.22	0.18
	Water	–0.04	0.11	–0.29	–0.09	0.00
	Waste	–0.34	–0.21	–0.56	–0.37	–0.32
	Average	**0.09**	**0.23**	**–0.13**	**0.01**	**0.10**
Broadly economic	Economic growth, investment	1.18	1.21	1.12	1.11	1.25
	Employment	1.17	1.07	1.32	1.15	1.18
	Skills	0.68	0.68	0.69	0.63	0.74
	Average	**1.01**	**0.99**	**1.04**	**0.96**	**1.06**
	Flooding	–0.30	–0.12	–0.64	–0.23	–0.38
	Land use	1.04	1.11	0.94	0.89	1.28

SA/SEAs suggest that core strategies will not achieve a high level of protection of the environment

Table 3 shows the findings of the analysis of the SA/SEA reports. It suggests that core strategies overall are helping to achieve social and economic objectives (average 1.06 and 1.01, respectively), but that they have between mildly positive and mildly negative effects on achieving environmental objectives (average 0.09). Air quality and waste production showed particularly negatively impacts, with the landscape and historic environment generally positively affected. Flooding, which has social, environmental and economic impacts, was also negatively affected overall.

The more recent (2007–2008) SA/SEA reports do not show significantly different results from the earlier (2004–2006) reports, suggesting that core strategies are not becoming more environmentally sustainable over time. However, there are some significant differences between the SA/SEAs for submitted core strategies versus preferred options: the score for employment becomes better from preferred options to the submission document by an average of 0.25 or more, but those for crime, health, air, climate change, water, waste, flooding and transport becomes worse by an average of 0.25 or more. The most significant deterioration is for air and climate change. This does not mean that a given core strategy necessarily becomes less environmentally sustainable over time, but it does suggest that it may do so, for instance as a result of political pressure or increasing locational specificity.

In many cases the only negative impacts identified in the SA/SEA reports were on environmental factors, or environmental factors were clearly affected significantly more negatively by the core strategy than social or economic factors. Examples include:

- Ryedale's summary appraisal (shown in Table 4), which identified the core strategy as having strong economic benefits, significant social benefits, but a range of environmental costs;
- Craven's SA/SEA, which identified 35 negative impacts, 17 of which related to the two (of 11) objectives 'To maintain and enhance the natural and built environment' and 'To protect and improve air, water and soil quality and minimize noise pollution';
- Newark and Sherwood's SA/SEA, which identified six (out of 17) SA objectives as being 'potentially compromised by certain core strategy policies': all related to environmental quality or natural resources.

SA/SEAs are likely to underestimate negative environmental impacts

The environmental impacts identified by the SA/SEAs were, in many cases, likely to be underestimated – at times significantly so. This may be because the appraisals are carried out either in-house or by consultants commissioned by the local authority; the local authority will wish its plan to be adopted with minimal obstruction, and so there is an incentive for the appraisal report not to sound critical. It may also be because plan authors must only 'take into account' the SA/SEA findings, and that where the appraisers are not the plan authors, they may feel that 'feedback sandwiches' of mostly praise with some gentle suggestions for change are more likely to be taken into account than hard-hitting criticism.

The underreporting of negative environmental impacts in the SA/SEAs considered for this research took the form, for example, of use of input rather outcome indicators; untested assumptions about mitigation; and straightforward bias.

Input vs outcome indicators

One difficulty with plan-level appraisal is that most plans have only indirect and partial effects on a given

Table 4. Example of SA/SEA summary: Ryedale

Sustainability aim Core policy	Social progress which meets the needs of everyone	Effective protection of the environment	Maintenance of high and stable levels of economic growth and employment	Prudent use of natural resources
1	+	+	++	0
2	0	–	+	–
3	+	0	+	0
4	+	–	+	–
5	+	0	++	–
6	0	–	++	–
7	+	+	+	0
8	0	+	0	+
9	+	0	+	0
Cumulative	+	0	+	0

Core strategies overall are helping to achieve social and economic objectives, but have between mildly positive and mildly negative effects on achieving environmental objectives

environmental component, and only an indirect remit for remedying these effects. For instance, a core strategy must provide for the development of new homes, and can (in limited circumstances) specify rigorous energy efficiency standards for them. However, the actual effect of these homes on greenhouse gas emissions will depend partly on how they are built and how their inhabitants subsequently use them, neither of which is controlled by the core strategy.

As such, rather than testing, say, whether their core strategy reduces greenhouse gas emissions, many local authorities opt to test what is within their remit – an 'input' objective – for instance whether the core strategy encourages the production of renewable energy. Essentially this tests whether a core strategy minimizes its own impacts rather than whether it reduces total environmental impacts. These factors can lead to a positive appraisal even where the environmental outcome is negative. Examples include:

- Black Country: 'The interaction of [policies A, B, C and D] will support the minimization of waste and sustainable waste management. Significant positive effects over the short, medium and long term.'
- Eden: '[Policies X, Y and Z] have been appraised to score positively against climatic factors on the grounds it emphasizes accessibility and reducing the need to travel. Both aspects will have the knock on effect of reducing CO_2 emissions from private car usage thereby having a positive impact on climate change.'
- Sheffield: 'By making facilities more accessible the need to travel will be reduced, therefore reducing emissions caused by traffic; Investment in public transport and pedestrian and cyclist infrastructure aims to ease congestion, thus having a positive impact on levels of air pollution.'

That said, many SA/SEAs gave a very realistic and well-balanced picture of the core strategy's impacts, for instance:

- Great Yarmouth: 'Will it reduce the emissions of greenhouse gases by reducing energy consumption? –'; 'Will it lead to an increased proportion of energy needs being met from renewable sources? ++'
- Sedgefield: 'The preferred options will not necessarily protect and enhance the natural resources of air, water and land. Significant impacts may result from the [core strategy]. Locating the majority of new development…in existing urban areas will reduce the need for additional supporting infrastructure and therefore resource use. However, considering the scale of regeneration activity, estimated house building activity (e.g. 4,000 new homes) and economic growth there will still be a significant additional resource use…'

Untested assumptions about mitigation

For many plans, impact mitigation is only realistically possible at a project level or through lower-level plans such as a site allocation or development control plans. Many SA/SEAs make assumptions about the effectiveness of these yet-unidentified mitigation measures when appraising the core strategy. Many SA/SEAs also (correctly) consider the core strategy in the round, so that (for instance) policies that protect biodiversity interests are assumed to help protect against the impacts of housing developments.

However, this raises the question of the scale and likely implementation of these mitigation measures: Will they be able to fully neutralize the core strategy's negative impacts? Will they be at least as likely to be implemented as the policies causing the negative impacts?

One of the interviewed planners noted that 'Our core strategy is sustainable in its entirety. However, if developers do not comply with all elements of the strategy, then the resulting development is not sustainable'. Islington's SA/SEA report also made this point: 'Unless every new residential development is zero emissions then the overall quantity of CO_2 emissions in Islington will increase'. It gave the relevant policy a mark of '– –', clearly implying that zero emission development will not take place.

However, many of the SA/SEA reports analysed for this research assumed that all policies in the core strategy would be fully implemented. More worryingly, many also used mitigation measures to 'upgrade' the SA/SEA to a rating beyond neutral. Examples include:

- Charnwood: The SA/SEA states that the core strategy policy on housing and employment land supply and phasing will have a positive environmental effect, noting that: 'Given that the policy phases the release of land for development, particularly for housing, this will protect Greenfield sites and thus during the plan period is likely to cut the effects on biodiversity, flora and fauna, landscape, soil resources and quality, reducing contributions to climate change'.
- Shrewsbury: The development of 6,550 new dwellings was appraised as having no impact on flooding 'subject to location and sustainable drainage'.

- Gloucester: The SA/SEA gave a positive answer to the question 'Will [the policy on provision of about 10,000 new homes] conserve and enhance natural/semi-natural habitats?', noting that 'All four [policy options] require new housing development, whether speculative or planned, to have regard to the proposed spatial strategy which seeks to ensure the protection of environmentally [sensitive] parts of the City.'
- Tynedale: The SA/SEA report notes, for the waste objectives, that 'The sustainability appraisal has been able to shift the impact of the Core Strategy on this sustainability objective from being neutral with no identifiable relationship, to one of being likely to contribute to the achievement of the objective. This has been achieved through adding a specific clause to policy BE1 that focuses on encouraging the minimization of waste and recycling'.

These points suggest that positive environmental impacts identified in many SA/SEAs may be based more on whether an attempt has been made to mitigate the impacts of what appears to be seen as inevitable development than on whether the plan is actually environmentally sustainable: SA/SEAs may assume that 'less bad than before' or 'less bad than other options' means 'good'. That said, SA/SEAs do seem to propose a wide range of mitigation measures that reduce plans' environmental impacts, thereby contributing to the integration of environmental considerations into the preparation of plans, even if the plans themselves are not environmentally sustainable.

A positive counter-example is North Northamptonshire's SA/SEA, which clearly considered the impacts of implementing the core strategy, including proposals for road improvements to support the growth levels 'largely 'handed-down' by Government through (the) Regional Spatial Strategy'. The report stated that:

> 'The core strategy appears to take an approach that strongly supports increasing road capacity as one of the major ways to deliver the needed growth levels in the North Northamptonshire area, rather than promoting intensive investment in public transport…no new road building should occur unless there is a clear proven need that would bring benefits to the area for the long-term which could not be achieved through more innovative transport planning.'

Some SA/SEAs do not discuss the cumulative impacts of the plan on each environmental component, making it impossible to determine how the impacts of various parts of the core strategy interrelate, and whether mitigation measures in the plan successfully counterbalance any negative impacts.

Mistakes or bias

Some appraisals seem to simply be mistaken or biased, consistently understating the core strategy's likely environmental impacts. Examples include:

- Ashford: The SA/SEA gives a mark of '+' to the objective 'The [plan] will explicitly avoid direct, indirect or cumulative impacts on designated [nature conservation] sites', although the accompanying text states: 'Approximately 10ha of the Willesborough Dykes [Site of Nature Conservation Importance] will be absorbed by development, with a fundamental change in the drainage regime required for the creation of the canal district. This will have impacts on the natural ecosystem and biodiversity'.
- Penwith: The SA/SEA used different appraisal tests for positive and negative impacts. It used as significance criteria: '++ significant positive effect, + positive effect, * no clear relation, +/- policy could have both negative and positive impacts on this objective, ? the policy could have a negative impact, x the policy will conflict with the objective'. The analysis of cumulative impacts had the categories 'positive cumulative effects' and 'potential negative cumulative effects'; it gave no indication as to why the plan's positive effects would be more certain than its negative effects.
- South Lakeland: Although the SA/SEA appraisal tables showed water resources to be affected consistently negatively by the core strategy, the main text concluded: 'Significant positive effect: PO9 specifically includes promotion of the prudent use of resources including water. It seeks to protect water resources from pollution, minimize the risk of flooding and promote the use of sustainable urban drainage systems… No significant negative effects were identified against this objective'.

For all these reasons, it is likely that Table 3's results should probably be adjusted to show a negative overall environmental impact rather than a neutral one. In turn, this suggests that the disparity between core strategies' positive economic and social impacts and their neutral/negative environmental impacts may be even greater than suggested in Table 3.

Planners suggest that the planning process is biased towards social and economic factors

The interviews and questionnaires of planners led to similar findings. During the interviews, the planners consistently stated that their core strategy was economically, socially and environmentally sustainable, but they also highlighted constraints to a fully sustainable core strategy. For instance they noted:

> '[Our plan] is sustainable up to a point, but

there are difficulties in reconciling the rural nature of the area with the objective of reducing the need to travel by private car.'

'The options available to us are guided from the regional level and are largely a result of the top down process. Therefore options are limited. However, the core strategy is sustainable because the whole ethos of planning is based around sustainable development and environmental protection'.

'There is an inherent conflict between the different components of sustainability. Increased housing and other requirements fed down through the Regional Spatial Strategy are likely to weaken the environmental sustainability'.

The questionnaire for local authority planners, which aimed to distinguish more clearly between the plan-making and SA/SEA processes, provided a more intriguing picture. It asked whether planners felt that the planning and SA/SEA processes favour the environment, the economy, or social factors. Of the 14 respondents, five felt that it favoured the economy, four that it favoured social and economic dimensions, one that it favoured social factors, and four that it was balanced (Figure 1). Eight respondents felt that the SA/SEA process was balanced and six that it favoured the environment. The respondents overwhelmingly felt that the SA/SEA process changes plan-making to be more balanced.

Two respondents added that the Government's emphasis on the delivery of specific housing and employment levels skews the planning process in favour of economic and social issues. Two noted that SA/SEA reports must be sent to environmental authorities, and one that the integration of SEA into SA makes the SA/SEA process look as if it favours the environment. However, the last respondent then added: 'I am in agreement that the environment needs to take precedence because of greater long-term sustainability concerns'.

Interestingly, given that many of the environmental impacts of core strategies are due to the housing levels they are required to provide as a result of Regional Spatial Strategies,[4] and that core strategies' ability to mitigate these impacts is often limited by national Government planning guidance, surprisingly few SA/SEA reports blamed regional and national policy for their negative impacts. Some of the few exceptions are:

- 'The principal recurring significant adverse effects arose from the increase in housing stock and new employment sites on water, waste and energy…these are accepted as consequences of meeting targets required by government policy and the county Structure Plan'.
- 'Whilst some tensions have been identified, particularly relating to protecting and enhancing the natural environment, landscape and biodiversity, this is inevitable given the Plan's objective of accommodating the growth requirement from the South East Plan.'

In summary, SA/SEA does not seem to be leading to core strategies that achieve a high level of protection of the environment. This is probably due to the need to achieve other sustainability objectives. However, the SA/SEAs do not explain how or why these trade-offs are being made; they are not justifying why environmental protection is not being achieved. As such, they are not leading to effective outcomes. But do SA/SEAs provide effective inputs to decision making, to help plans become more environmentally sustainable?

SA/SEAs are not identifying what constitutes a 'high level of protection of the environment' or testing core strategies against it

Many SA/SEA reports identify environmental standards – for instance on air and water quality and greenhouse gas emissions – as part of their analysis

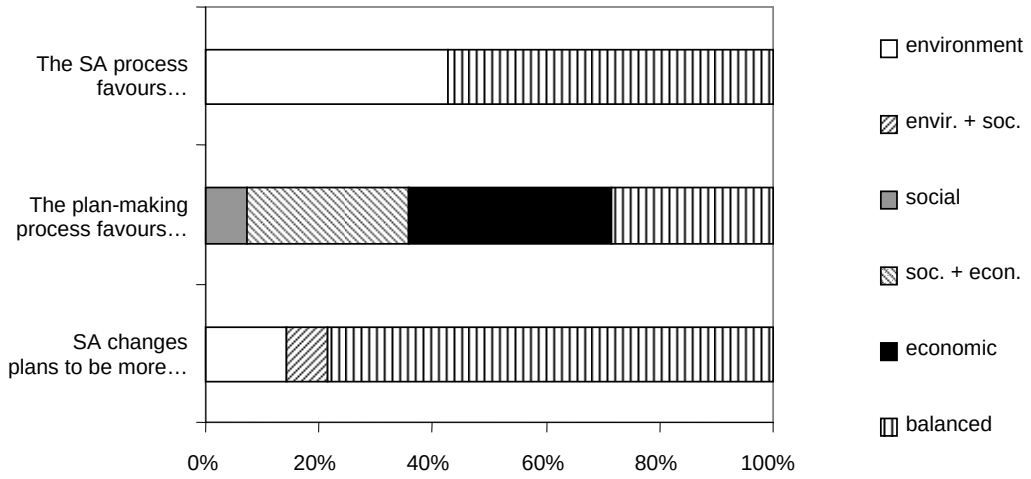

Figure 1. Environmental, social or economic bias? Planners' questionnaire responses (n=14)

of policy context. Many SA/SEA objectives are also phrased in ways that suggest they will test the core strategy against environmental standards or limits,[5] for instance: 'meet air quality targets' (Test Valley), 'reduce flood risk' (Tynedale), 'limit water consumption to sustainable levels' and 'avoid damage to designated sites and protect species' (both South Cambridgeshire).

However, none of the 45 SA/SEAs analysed then fully tested the core strategy against these standards or limits, and very few made any attempt to quantify the scale of impacts. Typical analyses were:

- South Cambridgeshire: On whether 20,000 new homes in the district would maintain water consumption at sustainable levels: 'Expansion will increase resource consumption, however this is inevitable if housing expansion is imperative', not whether the additional water consumption would lead to any aquifers being over-abstracted.
- Doncaster: On the climate change impacts of the development of Robin Hood Airport as an intermodal transport interchange, where permission had been granted for up to 57,000 air transport movements and 60,000 tonnes of freight per year: 'Policy CS/A1 has the potential to negatively affect greenhouse gas emissions', not whether the plan would allow government greenhouse gas targets to be achieved.
- Redcar: On the waste produced by 10,860+ new dwellings to be built between 2007 and 2016: 'More housing will generate more waste'; not whether the waste could be managed in a way that would not breach limits for air quality, water quality etc.

The analyses that came closest to testing whether a core strategy was likely to breach environmental limits were for specific development locations, but even these fell short of a full test.[6] A rare example of quantification of impacts was for Penwith:

> 'A study by CPRE…estimated the building of one new home…as being responsible for: Emissions of climate changing greenhouse gas emissions equivalent to 35 tonnes of CO_2; The production of 11.25 tonnes of solid waste; Consumption of 60 tonnes of aggregates quarried from the ground or dredged from the seabed (although some is recycled). For 7,800 new dwellings this equates to…a yearly increase of 13,650 tonnes of CO_2 emissions, 4,387.5 tonnes of solid waste produced and 23,400 tonnes of aggregates quarried.'

However, again this kind of data does not provide much information for decision makers unless it is compared with environmental standards or limits, included in a comparison with other options, and/or suggests specific proposals for offsets to neutralize the anticipated additions.

Testing against environmental limits is made even more difficult where SA/SEAs combine several key sustainability concerns under one heading, so that impacts cannot clearly be identified. Examples include:

- Shrewsbury: One SA/SEA objective covered air, water and soil quality.
- Lancaster: The SA/SEA's environmental objectives were 'protect and enhance urban and rural landscape', 'environmental management', 'global threats' and 'transport'. The SA/SEA did not explain what these categories covered.
- Thurrock: The heading 'climatic factors' covered such disparate factors as minimizing the need for energy, reducing water use, reducing the need for road-based transport, and increasing farmers' markets and local trading schemes.

Combining impact categories or using vague categories means that a negative impact on one sustainability issue can be shown as being neutral when merged with a positive impact on another, even though the impacts do not cancel each other out.

None of the 45 SA/SEAs gave any indication of the circumstances under which environmental costs would be acceptable in return for social or economic benefits. As such, SA/SEA is not testing whether core strategies are promoting development within environmental limits, much less showing that they are. For the reasons discussed above, one SA/SEA's conclusions also cannot be compared against another's, and the comparative sustainability of different core strategies cannot be determined based on the findings of their SA/SEAs.

SA/SEAs are partly contributing to the integration of environmental (or sustainability) considerations into the preparation and adoption of core strategies

A final component of SA/SEA effectiveness is whether plans take the SA/SEA findings into account. The questionnaire to planners asked whether respondents agreed with the statement 'the SA had little influence on the plan'. Of the 12 respondents, three agreed with the statement, four disagreed, and the rest neither agreed nor disagreed.

Most of the 14 planners interviewed noted that, although the SA/SEA process helped to test whether the core strategy was sustainable, it resulted in few changes to the strategy:

> 'Although small alterations were made [to our core strategy] as a result of the SA findings, most decisions were not impacted. We mostly carried out the SA to ensure that there could be no legal challenge.' (Similar statements were made by three other planners.)

> 'SA does not have the main role of achieving sustainability, since sustainability is a cross cutting element for the whole [core strategy anyway]. SA is not particularly useful for identifying positive impacts, but it checks for unforeseen negative impacts.'
>
> 'We made a few changes in the light of comments from the consultants.'
>
> 'The SA provides useful information, but its results have not been used well.'

That said, SA/SEA may well have a more indirect, long-term benefit in making planners aware of sustainability issues as they are writing their plans, rather than acting as a relatively late-stage trigger for identifying mitigation measures. For instance, several of the planners interviewed noted that foreknowledge that SA/SEA was going to be carried out made the plan authors think more seriously about a wider range of sustainability issues from the start, with the result that plans tended to be better for sustainability, and have fewer avoidable problems, before the SA/SEA assessment even took place.

Conclusions

This research suggests that SA/SEAs of English core strategies, and probably other development plan documents, are not fully achieving the objectives of the SEA Directive:

- SA/SEAs are not 'leading to a high level of protection of the environment'. SA/SEA findings suggest that most core strategies are likely to have neutral or negative environmental effects. The negative environmental impacts of most core strategies are unlikely to be fully offset by other plans, leading to cumulative environmental impacts.
- SA/SEAs are partly 'promoting sustainable development' in that they are supporting socially and economically beneficial core strategies and helping them to become less environmentally harmful. However, one component of sustainable development is 'living within environmental limits': SA/SEAs are neither identifying what those limits are nor testing core strategies against them.
- SA/SEAs are partly 'contributing to the integration of environmental considerations into the preparation and adoption of plans': they are leading to the integration of mitigation measures into core strategies that make them less environmentally damaging, but their effectiveness is hampered by national and regional plans, weaknesses of the SA/SEA system, and other factors.

Several factors may account for this. First, the integration of SEA into the SA process may be weakening the environmental focus of SEA in favour of social and economic concerns (e.g. Morrison-Saunders and Fischer, 2006). One of the planners interviewed noted: 'SA was invented to neuter EU SEA requirements and it has worked.' On the other hand, many social and economic benefits go hand in hand with environmental protection; planners inevitably draw a balance between competing issues so that provision of a single-issue report does not, of itself, lead to a greater consideration of that issue; and SA/SEA allows for consideration of complex, win–win issues and measures better than would SEA alone.

SA/SEA has several characteristics that do not allow a robust testing of whether a core strategy leads to a high level of protection of the environment or stays within environmental limits. These include not testing against environmental standards or limits; use of input rather than outcome objectives (and thus not distinguishing between a 'less bad' impact and one that is 'good'); and lack of quantification and modelling. In practice, the limited analysis of cumulative impacts in most SA/SEAs also hinders their use in decision making.

Core strategies also have a limited remit, which essentially requires them to promote environmentally harmful actions but does not give them the remit to mitigate those impacts. Core strategies must, for instance, plan for the housing allocations given to them by Regional Spatial Strategies, and be in line with national Government policies on airport growth and road proposals. However, they can only exceed national standards on issues such as water use or the energy efficiency of developments 'if they have sound evidence that it is justified by local circumstances' (CLG, 2008). This puts a burden on local (and regional) authorities to research and defend such 'evidence' that few can contemplate, given the other pressures they are under. Where authorities have tried to do so (e.g. policies on renewable energy production and higher energy efficiency standards for larger developments in the draft South West RSS that would have saved local authorities from having to do this individually), these have been removed by the Secretary of State.

Core strategies also have at best limited remit to influence people's behaviour. Although they can help to provide 'carrots' – for instance energy- and water-efficient housing or development patterns that reduce the need to travel – they have few 'sticks' at their disposal. For instance, they cannot require water metering or raise energy prices, much less impose caps on people's per capita use of resources.

Similar research on the environmental sustainability of Regional Spatial Strategies (CPRE *et al*. 2007) also concluded that, despite good intentions and good policies, none of the RSSs came close to ensuring environmentally sustainable development. Causes for this included:

- The limited remit of RSSs where, for instance, they could promote housing and employment

development, but not the fiscal regimes or behavioural change that would allow the negative impacts of development to be neutralized;
- The fact that subregional policies were often developed separately from regional-level policies, often in ways that pre-empted or contradicted the regional policies;
- The perceived need to be economically competitive with regard to other regions;
- The fact that unsustainable development is still often more profitable for companies and cheaper for consumers than more sustainable options; and
- Weaknesses in the SA/SEA process, including the lack of any obligation on planners to act on SA/SEA findings, the lack of quantitative targets against which SA/SEAs must test plans, and a general lack of really critical assessment.

Possible ways of addressing these problems include:

- Identification of environmental limits or capacities for each local authority. Exploratory work on this has begun nationally (e.g. Haines-Young *et al*., 2006) and in some English regions (e.g. Smith and Pearson, 2008). However, in a small and densely populated country such as England, with high development pressures, there will inevitably be a difficulty in agreeing on what levels of impact are acceptable or tolerable;[7]
- Clarification as to the circumstances in which an environmental cost can be acceptable in relation to social and/or economic benefits, and identification of circumstances under which no environmental harm will be acceptable. For instance, Gibson *et al*. (2005) propose sustainability trade-off rules that could inform this;
- A requirement for SA/SEAs to discuss plans' impacts in terms of environmental outcomes or limits (quantified where possible) rather than inputs;
- Agreement on what types of effects (and combinations of effects) will produce a positive, negative and neutral SA/SEA rating, and what degree of severity of effect will cause the findings to be considered significantly positive or negative. SA/SEA should specify whether 'positive' impacts are interpreted as those that (a) will make a negative impact less bad, (b) will have a positive impact, or (c) will achieve (or make a proportionate contribution to) true sustainability;
- A requirement for SA/SEAs to discuss the magnitude and likelihood of implementation of mitigation measures with regard to the policies whose impacts they are mitigating;
- Clarification of the fact that an impact can at best be neutralized, not made positive, through mitigation (unless there is clear evidence to the contrary); and
- A requirement for SA/SEAs to identify problems or conflicts rooted in higher-level policies, and to specify the actions by higher-level authorities needed to allow a sustainable plan to be developed.

These points could be incorporated into updated SA/SEA guidance by communities and local government, perhaps in response to ongoing work on improving the efficiency and effectiveness of SA/SEA. This approach would involve a mindset that is more clearly focused on environmental limits and cumulative impacts, and more baseline led rather than objectives led.

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Notes

1. For non-renewable resources, environmental protection may be a necessary prerequisite of sustainable development. However, for other environmental resources there are clear trade-offs as to how to best use resources now and in the future to maximize welfare. For instance, there are trade-offs between using land now for, say, housing, versus keeping it in its current use for, say, the amenity or biodiversity value it provides. Neither will be a priority in all cases: sustainable development may involve one of these approaches in one area, and another approach in another area.
2. There are some exceptions, for instance agricultural and forestry development projects. In addition, from 2010, planning applications for some types of major infrastructure projects will be determined by a national-level Infrastructure Planning Commission using National Policy Statements as a basis.
3. The questions were deliberately left rather vague to encourage respondents to explain what they meant by 'sustainability'
4. We do not suggest that the national/regional housing numbers should not be delivered, as not doing so would be unsustainable on social grounds and would lead to a challenge to the plan. Rather, it is the fact that local authorities are required to provide for large numbers of new homes but not given the powers to ensure that those homes are environmentally sustainable that is the issue.
5. Defra research (Haines-Young *et al*, 2006) defines environmental limits as 'the level of some environmental pressure, or level of benefit derived from the natural resource system, beyond which conditions are deemed to be unacceptable in some way'. Examples include levels of fishing above which fish stocks collapse, levels of water extraction above which long-term depletion of aquifers occurs, and levels of greenhouse gas emissions that lead to climate changes that are dangerous for people or ecosystems. Clearly it would be difficult, if not impossible, to define these limits with precision.
6. Interestingly, 'appropriate assessment' under the Habitats Directive does often test whether a plan would breach environmental limits as part of its test of whether the plan would affect the 'integrity' of any Natura 2000 site. This is made easier by the fact that Natura 2000 sites have a restricted geographical coverage and their 'integrity' depends on a limited number of factors.
7. Environmental capacities or limits have both an objective dimension (the level of natural resources and the pressures on these resources) and a subjective dimension (a judgement of when a reduction in environmental benefits is no longer acceptable).

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