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Ecological compensation of highway impacts; negotiated trade-off or no-net-loss?

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Chapter 8

Summary of results



Summary of results

This chapter, concerned mainly with use of the ecological compensation principle in the context of national road schemes, presents the results of the articles reprinted in the chapters of Part 2. These are grouped under eight headings, as follows:

- planning and decision-making (8.1)
- implementation and results (8.2)
- compensation costs (8.3)
- evaluation and monitoring (8.4)
- legal aspects (8.5)
- public support (8.6)
- gaps in knowledge (8.7).

In the following text, numbers in square brackets and bold type indicate the chapter of Part 2 to which the results in question refers, viz.:

- [2]** Ecological compensation of the impacts of a road; preliminary method for the A50 road link (Eindhoven-Oss, the Netherlands).
- [3]** Guidelines for ecological compensation associated with highways.
- [4]** Ecological compensation in Dutch highway planning.
- [5]** Preparation and implementation of seven ecological compensation plans for Dutch highways.
- [6]** Compensating for ecological impacts of road development: seven years' experience with Highway A50 (Eindhoven-Oss, Netherlands).
- [7]** Improving ecological input in Dutch road planning.

The aspects of compensation treated in each of the chapters of Part 2 are summarised below in the form of a matrix, used as a reference point in drawing the conclusions presented in the following eight sections.

Chapter	Planning, decision-making	Implementation	Costs	Evaluation, monitoring	Legal aspects	Public support	Gaps in knowledge
2 Preparation of compensation plan method for A50 road link							
3 Guidelines for ecological compensation							
4 Ecological compensation in highway planning							
5 Preparation and implementation of seven compensation plans							
6 Seven years' experience with highway A50							
7 Improving ecological input in road planning							

8.1 Results on planning and decision-making

1. With each new phase of planning and decision-making on a given road project, compensation measures are specified in ever greater detail in terms of nature, scale, location and cost. Nonetheless, there is still a considerable mismatch between 'supply' and 'demand' of ecological data in the respective phases.
2. In several of the national road projects investigated, certain infrastructure alternatives (A2: Tangenten Eindhoven) or variants (A4: Dinteloord-Bergen op Zoom) were abandoned during the planning stage as unrealistic given the scale and cost of the compensation measures implied [4].
3. In the projects studied the estimated cost of the compensation measures associated with the infrastructure alternatives and specified in the Routing EIA ranged from zero (no ecological impact on areas requiring compensation) up to € 14.9 mln. (US\$ 16.0 mln.). The latter figure, for the

A4 (Dinteloord-Bergen op Zoom) was 8.2% of the total project investment sum. At the Routing Decision stage, it was subsequently opted to implement an infrastructure alternative having less ecological impact, with compensation costs projected at only 2.3% of total investments [4].

4. On the other hand, estimated compensation costs may rise as planning progresses. This was the case with the A4 (Delft-Schiedam), where the upper estimate rose from 0.7% of total investments (€ 1.1 mln., US\$ 1.2 mln.) in the Routing EIA to 7.3% (€ 13.1 mln., US\$ 14.0 mln.) in the Routing Decision. This was because more detailed information, obtained only in the (Draft) Routing Decision stage, indicated that compensation sites would have to be purchased after all, while previously it had been thought that management contracts could be concluded with farmers, with no need for property changing hands [4].
5. Routing Decisions on national road projects currently embody a dual decision: first, on the envisaged costs and benefits and perceived necessity of the project and, second, on the scale and nature of the mitigation and compensation measures required [3,4].
6. In the road projects investigated, between 2 and 5 years were required for drawing up and finalising the ecological compensation plan (CP) [5,6]. In all these cases the CP was drawn up *after* the Routing Decision. For new projects the timetable is likely to be shorter, first because compensation measures will have been largely elaborated *prior* to the Routing Decision and second because of the experience meanwhile gained in preparing such compensation plans [5].
7. Deriving compensation measures at the project planning stage makes it difficult to guarantee that the principle of no-net-loss of ecological values will ultimately be respected. At this early stage there is too little focus on value 'replaceability', the time required to develop suitable compensation sites and whether, at the end of the day, the values impaired or lost will be adequately compensated. There are also insufficient guarantees that *Rijkswaterstaat*, as project initiator, will indeed be able to dispose over the envisaged compensation sites when the time arises [3].

8. The standard additional 'quality compensation' sum, designed to make up for quality differences between the compensation site in virgin and ultimate state as well as the time required to achieve this transition, works well in principle and is no longer a real issue, even for interest groups [5,6]. This suggests that other aspects of ecological compensation might likewise be standardised, for example derivation of out-of-kind compensation. However, while such standardisation would have practical benefits as well as the appeal of increased transparency, it would be difficult to underpin ecologically [3].

8.2 Results on implementation

9. Due to the implementation horizon of the CP for a national road project (several years), there will inevitably be deviations from the terms of the original CP [5,6]. First, there is little way of knowing when or where appropriate compensation sites will be forthcoming. Second, potential sites may later be lost to housing or other developments, or have to be rejected in the light of new information (e.g. discovery of soil pollution) [6]. Third, and conversely, new compensation sites may emerge that were not foreseen in the CP, following discontinuation of farming operations, for example.
10. A key bottleneck in practical CP implementation is acquisition of suitable sites, particularly in the most populated regions of the Netherlands [5,6]. Owing to declining 'land mobility' and the associated rise in real estate prices, since the early 1990s ecological compensation has had to compete ever more with other development projects for land (e.g. housing developments) or even for the conservation sector itself (e.g. realisation of the Ecological Main Structure) [3,6]. For the same reason ecological compensation must also compete with other interests within one and the same road project, starting with the land required for the roadway itself [6].
11. Although the lands required for the A50 (Eindhoven-Oss) CP will have been acquired by the time the link is opened, or at least largely so, work on adaptive design and management of these sites is not anticipated to have been completed by then, let alone subsequent transferral to conservation organisations. If this is indeed the case, a portion of the CP budget will

remain unspent and the aim of no-net-loss of ecological values will not have been secured by the time the link is opened [6].

12. The Dutch procedure for implementing CPs favours 'patchy' compensation over multiple, unconnected sites, generally reducing overall ecological effectiveness [6]. As long as the lands are acquired within oversized 'search area' for compensation sites (oversized compared to the extent required for compensation purposes) this will remain an intrinsic problem.
13. Acquisition of suitable compensation sites is hampered not only by the short supply of land but also by the national policy forbidding government authorities and agencies to pay more than the going market price for real estate, to prevent additional prices hikes [6]. As a consequence, *Rijkswaterstaat* cannot always make full use of promising opportunities for ecological compensation.
14. As the case of the A50 (Eindhoven-Oss) demonstrated, it is difficult to secure CP objectives when compensation is implemented via a Land Adaptation project. This is because compensation objectives in these projects usually conflict with conservation aims in one way or another. Implementation of the CP is generally delayed considerably, moreover, owing to the relatively large number of parties involved [6].
15. In Dutch implementation of the compensation principle, scarcely any consideration is given to contingency planning, as is the case in the UK, where there is prior elaboration of steps to revise or adjust original compensation measures in the event of disappointing results (cf. Result 25) [3,4,5,6].
16. Apart from the A1 (Holendrecht-Oudenrijn) none of the projects investigated involved financial compensation in the form of payments into the so-called Green Fund (cf. Result 21) [5]. This means that *Rijkswaterstaat* has a commitment to undertake physical compensation measures.
17. The CPs investigated indicate that in those cases where the plan remains unfinished for one reason or another, financial compensation will be paid by

the developer, the unspent portion of the compensation budget being transferred to the Green Fund [6]. Although this accords with the basic principle of ecological compensation, theoretically causing no-net-loss of ecological values, this is not the case in practice [6]. This is because there is no guarantee that the rest of the CP will eventually be implemented by others, the Green Fund administrator being free to use incoming funds for other conservation projects [3].

18. When it comes to practical implementation specific guidelines are still lacking on several key aspects of the compensation principle, in particular:
1) the point in time at which the project initiator is relieved of the obligation to compensate, 2) the relationship between compensation sites and the Ecological Main Structure, in terms of spatial zoning, and 3) the relationship between long-term management of compensation sites and the EMS funding programme [3].

8.3 Results on compensation costs

19. The investigated CPs that are still in progress indicate that compensation measures may be up to about 4% of the total project investment sum earmarked for national road projects [5].
20. Because of the sharp rise in Dutch land prices in the latter half of the 1990s, without a revision of standing budgets none of the road CPs currently in progress will be on target with respect to compensation site acquisition, design or management [5,6]. Such budget revisions can in principle be based on standard price indexing.
21. There are no clear-cut guidelines on financial compensation in the event of CP targets not being secured by the time the new road section is opened. Unforeseen cost increases during implementation mean overspending on the original CP budget and as a result the sum remaining and thus available for financial compensation will no longer be adequate for the measures yet to be implemented [4,5,6].

22. Even before work on implementation starts, ecological projects financed from the Green Fund will be adversely affected by any price rises occurring between transfer of financial compensation and project implementation [5], thereby detracting from the original conservation aim of this fund.

8.4 Results on evaluation and monitoring

23. With the exception of those for the A50 (Eindhoven-Oss) and A73 (Venlo-Maasbracht), none of the CPs studied had any provisions for monitoring or evaluating CP implementation and the instruments employed to that end. Nor was there much attempt to develop procedures for monitoring the ultimate effectiveness of the individual compensation measures; indeed, it was only with the A50 (Eindhoven-Oss) that any ideas on this point were spawned at all [4,5,6].
24. In none of the ongoing CPs examined has there been any attempt at ex-post evaluation of decisions on specific forms of ecological compensation or the underlying methods used to predict ecological impacts and derive appropriate mitigation and compensation measures [4,5,6].
25. More broadly, this lack of monitoring and evaluation means that there is virtually no way of assessing whether Dutch CPs actually achieve no-net-loss of ecological values, even when fully implemented [4,5]. This also hampers use of contingency plans as a means of revising CPs should that prove necessary during implementation.

8.5 Results on legal aspects

26. Despite the government's pledge in the Structure Plan for the Rural Areas to assess whether the compensation principle should be duly grounded in legislation, a positive decision on this point is yet to be taken [3]. In other words, the ecological compensation principle still has no legal footing in the Netherlands.
27. In the course of work on this dissertation the government has substantially extended the legal leverage for expropriating land-owners on the grounds of

a Routing Decision. That this option has not yet been used until now reflects the government's unwillingness to resort to compulsion [6]. An additional problem is how expropriation of a particular parcel of land for the purpose of ecological compensation is to be motivated. Given the lack of jurisprudence on this issue, it is unclear whether a compulsory dispossession order taken out on the grounds of a Routing Decision would be overruled if it were challenged in the appeals court.

8.6 Results on public support

28. Engaging interest groups in the articulation of a CP has benefits in the implementation phase [2,3,4,5,6]. Such groups have plenty of local as well as general ecological knowledge and are consequently in a good position to assess the feasibility of proposed compensation measures. Indeed, they usually play an active role in identifying suitable compensation sites. If land users join forces, 'win-win' situations may also result [3].
29. Some environmental organisations are wary of collaborating on ecological compensation in early stages of project planning and may even be critical of such an exercise, demanding that the perceived necessity and anticipated benefits of the project first be established [4].
30. From a general perspective, farmers seem to be in a good position to implement compensation measures to enhance ecological values in agricultural regions [2,5,6]. On the other hand, farmer management of compensation sites is at odds with the approach originally envisaged by *Rijkswaterstaat*, viz.: expropriation of lands, adaptive site design (if necessary) and transfer to a conservation trust, accompanied by land-use rezoning of the site(s) in question. An additional problem in this context is that farmers have still not been sufficiently recast as 'conservationists', despite all the policy efforts in that direction.
31. Farmer management of compensation sites generally does away with the need for land purchase or rezoning. *Rijkswaterstaat's* main motives for adopting this *modus operandi* is the potential for cutting costs (no land

purchase required) and for boosting regional support for the project in question (alternative sources of farmer income) [6].

32. It is as yet unclear whether the aim of no-net-loss of ecological values can be secured under current farm-based management regimes and whether guarantees as to long-term preservation of these values ('sustainability') approximate those achieved with the more traditional approach of purchasing sites specifically for compensation [6].

8.7 Results on gaps in knowledge

33. It is relatively straightforward to quantify the ecological impact of habitat destruction associated with road construction and subsequent disturbance of breeding bird populations by traffic noise, and it is for this reason that CPs for Dutch national road projects are based on these two impact categories [2,5]. In contrast, the effects on target species populations of habitat fragmentation, 'road kill', roadway illumination and hydrological changes are more difficult to quantify [2,4]. As a result, scarcely any attention has been given to measures to compensate for these latter impacts [4,5].
34. Although the notion of impact mitigation has been integral to road design for many decades [4,5], its effectiveness has still not been satisfactorily studied at the population level. This makes it more difficult to derive compensation measures appropriate to a given road project, hampering achievement of no-net-loss of ecological values [3].
35. Ignoring impacts that are difficult to quantify when deriving the compensation measures for a particular project [2,3] makes it harder to evaluate whether there is no-net-loss of ecological values.
36. Experience at *Rijkswaterstaat* has shown that out-of-kind compensation, i.e. compensation of lost or impaired ecological values in terms of 'substitute' values, leads to lengthy debates among parties [3]. This is not surprising, given that there is no trustworthy 'translation' procedure available for this purpose and therefore no way of evaluating to what extent out-of-kind compensation indeed contributes to no-net-loss of ecological values.

37. There is insufficient insight into the costs associated with compensation site acquisition, adaptive design and management, and the same holds for overrunning of CP budgets in the implementation phase [6] (cf. Result 20). There is a degree of mismatch between the cost indices presently employed nationally in the conservation context and the planning procedures in force for transport infrastructure.