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CASE STUDY REPORT: The use of eco-accounts in Baden-Württemberg to implement the German Impact Mitigation Regulation: A tool to meet EU's No-Net-Loss requirement?



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EXECUTIVE SUMMARY

The overall aim of this report is to identify and describe lessons that can be learnt from eco-account offsetting¹ schemes in Baden-Württemberg in Germany that may support the EU's intention of developing a policy by 2015 to "ensure no net loss of biodiversity and ecosystem services" (under Action 7 of the EU Biodiversity Strategy). The research aims to verify whether the schemes, which were put in place to implement offsetting requirements under the German Impact Mitigation Regulation (IMR), are effective and consistent with the EU's no-net-loss (NNL) objective and international offsetting principles.

There are two types of eco-accounts in place in Baden-Württemberg. The first eco-accounts schemes to be introduced were set up as a result of 1998 amendments to the Federal Building Code optimising the enforcement and implementation of compensation measures in urban development planning. These introduced spatial flexibility for developers having to carry out compensation measures for their developments. Besides the geographical disconnection between impact and offsetting, a temporal flexibility was introduced for municipalities allowing them to carry out compensation measures before any impact arises. The aforementioned spatial and temporal flexibility created the conditions for the emergence of formalised eco-account schemes under the building law at municipal level. In addition to this first type of eco-accounts, amendments to the Federal Nature Conservation Act in 2002 and 2009 introduced more spatial and temporal flexibility in the implementation of the requirement under the IMR as well as the possibility of "storing" anticipated offsetting measures. Following these amendments Baden-Württemberg, like many other German Länder, adopted implementing acts further specifying the conditions for the establishment of eco-accounts under the Nature Conservation Act. As a result, in Baden-Württemberg, eco-accounts established under the Federal Building Code and those established under the Nature Conservation Act co-exist.

The eco-accounts schemes in place in Baden-Württemberg are means to facilitate the offsetting of environmental impacts of developments (including impacts on landscape, soils, water retention, other ecosystem functions / services and biodiversity). They are a form of habitat banking because compensation measures do not offset residual impacts from specific developments and may be implemented in advance of anticipated developments. This enables developers to "buy" already implemented compensation/eco-accounts measures to offset the residual impacts arising from their development. Eco-points, which are attributed to both development impacts and the outcomes of compensatory measures, are used as measures of environmental loss (debits) and gains (credits); the aim being to ensure that positive impacts from compensation measures are at least equivalent to negative impacts arising from the development. Eco-points may be attributed to different impact categories, i.e. habitats/species, soil, water, climate/air or landscape features. Traded eco-points must be within the same impact category.

The hypotheses used in this report for testing whether the eco-accounts schemes in Baden-Württemberg are suitable instruments that may support the implementation of the NNL objective are that the eco-accounts:

- a) Internalise the costs of biodiversity loss and thus, by implementing the polluter-pays principle, encourage a reduction in impacts on biodiversity;
- b) Do not lead to a weakening of adherence to the mitigation hierarchy through a tendency to compensate for impacts where this has a lower cost than avoiding or reducing them (i.e. becoming a 'license to trash');

¹ Offsets are measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse impacts arising from project development after appropriate prevention and mitigation measures have been taken.

- c) Are a transparent and fair tool for compensating for unavoidable residual impacts through measures that provide measurable additional long-term benefits;
- d) Are a more cost-efficient way to compensate for biodiversity/habitat loss (and comply with no net loss requirements) than the traditional approaches developers could take to meet the requirements under the Impact Mitigation Regulation.

The results from this research project suggest that the eco-account schemes in place in Baden-Württemberg do indeed make a contribution to **internalising the external costs linked to the adverse impacts of developments on biodiversity and ecosystem services**. It must, however, be noted that in practice, this is must be attributed to the German Impact Mitigation Regulation rather than the eco-accounts themselves, which are just tools to implement compensation obligations. It must be pointed out, however, that current costs for compensation might not provide developers with sufficient incentives to strictly **adhere to the mitigation hierarchy** and that, by creating a market in which developers will seek to purchase compensation credit at the lowest possible cost, **could further undermine incentives to strictly adhere to the mitigation hierarchy**. This could indeed in some cases make the cost associated with compensation lower relative to impact avoidance and mitigation.

As regards the extent to which the eco-account tools enhance **transparency of compensation**, the eco-account under nature conservation law is much more straightforward and transparent as regards the quality criteria that compensation measures need to meet in order to be part of the scheme than the one under the building law. This is in particular due to the standardized forms and administrative procedures that are used together with a central compensation/eco-account registry (which allows public insight into key information relating to the registered compensation measures), a common unit of currency of compensation credits and a homogeneous evaluation model, all of which increase the transparency and fairness of the tool with respect to both the eco-accounts in place under the Federal Building Code as well as traditional on-site compensation by developers. This transparency has multiple benefits such as allowing for a better access to information for the wider public and supporting long-term monitoring of the implementation and maintenance of the compensation measures by public authorities.

Under both types of eco-accounts criteria are meant to ensure the **additionality of the compensation measures** and exclude ordinary maintenance measures and measures that have been implemented to meet other legal obligations, although certain grey zones exist when it comes to the eco-accounts established under the building law in municipalities. In addition, the eco-account under the nature conservation law explicitly states that compensation measures implemented in Natura 2000 and other protected areas are eligible to be registered as eco-account (compensation) measures, which arguably somewhat undermines additionality.

The **long-term maintenance of compensation measures** and the adequate monitoring in the long-term by public authorities appear to be one of the weaknesses in the way the IMR is being implemented. The compensation measures implemented through the eco-account system are not an exception to that, although the use of the eco-account does not seem to exacerbate the problem.

Available data on costs does not allow a quantitative analysis of the **economic effectiveness of the eco-account schemes**. Such data are difficult to obtain because it would require developers and compensation agents to disclose sensitive financial information, which they are understandably reluctant to do. **Administrative costs** to public authorities associated with managing requirements for compensation from developments to not appear to increase with the introduction and use of eco-account schemes. If a trend towards the implementation of larger compensation measures through eco-account schemes compared to traditional smaller scale on-site compensation measures is

confirmed, due long-term monitoring of the effectiveness of compensation measures by public authorities could become both easier and more cost effective.

As regards the **ecological effectiveness** of the eco-account schemes, those under the nature protection law have resulted in larger compensation measures compared to the size of the on-site compensation measures which would have been implemented in the absence of the eco-account schemes. Larger compensation or restoration measures may offer more scope for sustaining valuable habitats are usually thought to make a greater contribution to overall ecosystem resilience. The compensation measures in the eco-account registry attributed to an impact have indeed been used to compensate a wider range of smaller impacts that would otherwise have been offset in isolation, with lower benefits to biodiversity. Based on the currently somewhat limited sample of compensation measures attributed to impact a trend towards pooling of compensation is indeed observable: on average, one compensation measure was used to compensate for the residual impacts of 1.5 developments.

In conclusion the eco-account schemes help overcome a range of practical barriers to compensating residual impacts arising from developments (as required under the German IMR). In particular, the more recent eco-account scheme under the nature conservation legislation attempts to overcome potential risks of offsetting, such as those related to additionality, in particular by excluding ordinary maintenance measures and measures that have been implemented to meet other legal obligations from those eligible for registration in the eco-account registry.

Other issues that remain problematic, such as insufficient long-term monitoring of implemented compensation measures or missed opportunities for strictly adhering to the mitigation hierarchy, are not specific to the eco-account tool. The publicly available compensation registries that were introduced alongside the eco-account tool have the potential to improve long-term monitoring, provided public authorities recognise the need to invest more resources into such activities in order to ensure that losses are effectively compensated. In addition, it is the responsibility of public authorities to require developers to demonstrate that they have respected the mitigation hierarchy. This is particularly important for the credibility of the eco-account schemes since they may also have the adverse effect of creating a market on which developers may seek to meet their obligations to offset residual impacts at the lowest possible cost, potentially lower than investing into up-front impact avoidance and mitigation.

Finally, the eco-account schemes in place in Baden-Württemberg are primarily designed to offset impacts on a selected range of ecosystem functions/assets and while biodiversity loss is being offset via the scheme, this is rather in order to restore related ecosystem functions than for the biodiversity per se. Nothing prevents, however, the expansion of the scope of the instrument in order to include the restoration of both protected and non-protected biodiversity.

1 BROADER CONTEXT: THE EU POLICY PERSPECTIVE

To fully capture the importance of the subject, the development of compensation mechanisms and habitat banking schemes must be seen from a broad policy perspective. At the global level, relevant commitments can be found in **the CBD Strategic Plan for Biodiversity 2011-2020** and the associated Aichi Biodiversity targets (CBD 2013):

- *Target 2:* By 2020, at the latest, biodiversity values have been integrated into (...) planning processes (...).
- *Target 5:* By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
- *Target 14:* By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored (...).

In Europe, pressures on biodiversity (land use changes, urban sprawl, fragmentation and loss of natural habitats) have continued to intensify. As a consequence, EU's target of halting biodiversity loss in Europe by 2010 has been missed and overall health of ecosystems has deteriorated, as has their ability to provide important ecosystem services (e.g. those associated with water resources, soils, carbon storage, flood management, recreation and tourism) (EC 2010; EEA 2010; EU Rubicode project²). A key lesson from the failure to achieve the 2010 biodiversity target is that it will not be possible to halt the loss of biodiversity in future years without adopting policies and measures that can offset unavoidable residual impacts, especially those from infrastructure related developments. (EC 2010; Eftec/IEEP et al. 2010).

The EU has an overall headline biodiversity target which is to ***“halt biodiversity and ecosystem service loss by 2020, to restore ecosystems in so far as is feasible, and to step up the EU contribution to averting global biodiversity loss”***. To support the achievement of the EU target (and CBD Strategic Plan) the Commission has developed in cooperation with Member States, an EU post-2010 Biodiversity Strategy (EC 2011), including sub-targets as well as feasible and cost-effective measures and actions needed to achieve them.

Sub-target 2 of the Strategy states that ***“By 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems”***. This is supported by a number of Actions, including Action 7, which is to ***“ensure no net loss of biodiversity and ecosystem services”***. Of particular relevance in the context of this paper is Action 7b, which states that ***“the Commission will carry out further work with a view to proposing by 2015 an initiative to ensure there is no net loss of ecosystems and their services (e.g. through compensation or offsetting schemes).”***

Since the adoption of the Biodiversity Strategy, broad support has been expressed to a no net loss (NNL) initiative. The intention to ensure no net loss of biodiversity and ecosystem services was further encouraged in the Council conclusions on 21 June 2011 (Council EU 2011a), which emphasised the need to develop and implement a methodology taking into account existing impact assessment processes to assess the impact of all relevant EU-funded projects, plans and programmes on biodiversity and ecosystems. It also stressed the importance of further work to operationalise the NNL objective of the Biodiversity Strategy for areas and species not covered by existing EU nature legislation and of ensuring no further loss or degradation of ecosystems and their services.

² EU RUBICODE project: www.rubicode.net

The December 2011 EU Council Conclusions (18862/11) also provide the following preliminary definition of the no net loss concept: ***“that conservation/biodiversity losses in one geographically or otherwise defined area are balanced by a gain elsewhere provided that this principle does not entail any impairment of existing biodiversity as protected by EU nature legislation”*** (Council EU 2011b). They also agreed “that a common approach is needed for the implementation in the EU of the NNL principle and invited the Commission to address this as part of the preparation of its planned initiative on NNL by 2015, taking into account existing experience as well as the specificities of each Member State, on the basis of in-depth discussions with Member States and stakeholders regarding the clear definition, scope, operating principles and management and support instruments in the context of the common implementation framework of the Strategy”.

The need for a NNL initiative is also referred to in the Resource Efficiency Roadmap, which calls for proposals to foster investments in natural capital, to seize the full growth and innovation potential of Green Infrastructure and the “restoration economy” through a Communication on Green Infrastructure (2012) and a NNL initiative (2015).

In addition, the European Parliament also adopted a resolution on 20 April 2012 (EP 2012), urging the Commission to develop an effective regulatory framework based on the “No Net Loss” initiative, taking into account the past experience of the Member States while also utilising the standards applied by the Business and Biodiversity Offsets Programme. Importantly, the report also refers to the importance of applying such an approach to all EU habitats and species not covered by EU legislation.

Given the repeated reference to compensation and offsetting in relation to EU’s commitment to NNL, as well as the mention of habitat banking as a possible tool to deliver this principle, it is worth clarifying how these instruments are thought to potentially contribute to meeting the NNL objective.

2 ACHIEVING NNL IN PRACTICE: OFFSETTING IMPACTS THROUGH HABITAT BANKING?

Generally, compensation “is a recompense for some loss or service, and is something which constitutes an equivalent to make good the lack or variation of something else. It can involve something (such as money) given or received as payment or reparation (as for a service or loss or injury). Specifically, in terms of biodiversity, compensation involves measures to recompense, make good or pay damages for loss of biodiversity caused by a project” (Tucker et al, 2014).

Compensation measures for biodiversity loss may arguably, in some situations, be achieved through payments for training, capacity building, research or other outcomes that may lead to conservation benefits in the long run but not immediately measurable conservation outcomes on the ground. **In this study**, as in Article 6(4) of the Habitats Directive, **the term ‘compensation measures’ is considered analogous to offsets**. Habitat banks and biodiversity offsets, which are presented in the next section, are both mechanisms for delivering compensation.

2.1 Offsets

Despite the above described developments, there is still quite some uncertainty around what “no net loss” actually means in practice and how this is to be achieved. If this objective is to be reached, it appears likely that compensation for biodiversity losses through some form of offsetting will need to be used, among other actions. As defined by the Business and Biodiversity Offsets Programme (BBOP), offsets are “*measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken.*” (BBOP 2012: 19). Thus, offsets are formalised arrangements for delivering compensation and may be designed to achieve NNL, i.e. impacts on biodiversity caused by a project are balanced or outweighed by measures to offset the residual impacts so that no loss remains. Offsets can take the form of positive management interventions such as restoration of degraded habitat, arrested degradation or averted risk and protecting areas where there is imminent or projected loss of biodiversity. The goal will generally be to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people’s use and cultural values associated with biodiversity.

It should be noted that offsets must be considered in the context of the “**mitigation hierarchy**”, whereby, according to the Business and Biodiversity Offsets Programme’s, **appropriate** actions to achieve no net loss should be considered in the following order:

- a. **Avoidance**: measures taken to avoid creating impacts from the outset, such as careful spatial or temporal placement of elements of infrastructure, in order to completely avoid impacts on certain components of biodiversity.
- b. **Minimisation**: measures taken to reduce the duration, intensity and / or extent of impacts (including direct, indirect and cumulative impacts, as appropriate) that cannot be completely avoided, as far as it is practically feasible.
- c. **Rehabilitation/restoration**: measures taken to rehabilitate degraded ecosystems or restore cleared ecosystems following exposure to impacts that cannot be completely avoided and/ or minimised.
- d. **Offset (including through habitat banking)**: measures taken to compensate for any residual significant, adverse impacts that cannot be avoided, minimised and / or rehabilitated or restored, in order to achieve no net loss or a net gain of biodiversity.

The current drivers of demand to offset residual biodiversity damage thus predominantly relate to

legislation for biodiversity conservation and planning laws that require mandatory biodiversity compensation for residual impacts. At present, in EU legislation, direct drivers are limited to Natura 2000 sites and requirements for strictly protected species under the EU Habitats Directive (HD) and the incidents covered by the EU Environmental Liability Directive (ELD). In the context of the implementation of these legal frameworks, compensation measures are normally strictly regulated and must be project-specific offsets that are like-for-like (i.e. losses affecting one species or habitat should be offset by equivalent gains in the same species or habitat) and normally within or close to the project development site (more so for the HD) (EC 2007).

At a national level, planning procedures (in particular through SEA and EIA requirements) encourage and enable the development of compensation measures for residual impacts (e.g. that are part of the project proponents' development proposals after appropriate application of the mitigation hierarchy) but their enforcement in EU Member States is variable and legal requirements for implementation of compensation measures for residual impacts tend to be the exception rather than the rule (Eftec/IEEP et al. 2010; EC 2009).

In some countries, such as the USA, South Africa and Australia, and within the EU most notably Germany and France, offsets are required by law for some types of biodiversity impact resulting from developments. Developers seeking a permit for their development might be required by the planning authorities to demonstrate that they have attempted to avoid and minimise impacts as far as possible, intend to rehabilitate/restore where relevant and that they have foreseen measures to offset any residual impacts. In their most basic form such offsets often take the form of on-site post-impact habitat/biodiversity re-creation to fulfil the conditions outlined in the permitting decision. This conventional compensation practice outside a pool and within or in close proximity to the project development site often faces the key problem of how to find sufficient appropriate sites for the implementation of the compensation measures. For example in Germany, this reportedly resulted in planning authorities occasionally being inclined to waive the compensation of residual impacts because of the practical challenges to their implementation (Tucker et al, 2014). In addition, restoration compensation of residual impacts in the immediate vicinity of a development often led to isolated measures ("insular solutions") of a limited ecological effectiveness. For this reason, this solution has been increasingly considered sub-optimal both from an efficiency point of view as well as from an ecological perspective.

These intrinsic challenges with adequately offsetting residual impacts are thought to have triggered legislators in some of the other above mentioned countries to introduce some flexibility in meeting the requirements for offsetting and led to habitat banking schemes starting to be used in Europe (GHK et al. 2013). This was for example the case in Germany as of 2002 (Wende et al. 2005). The flexibility these new schemes introduced usually involved disconnecting offsets spatially and temporally from the residual impacts that needed to be compensated.

2.2 Habitat banking

Habitat banking concepts can be seen as an extension of offsets and have developed from approaches that offset damage to biodiversity in particular or the environment in general (Eftec/IEEP et al. 2010). Habitat banking has been defined as "*a market where the credits from actions with beneficial biodiversity outcomes can be purchased to offset the debit from environmental damage. Credits can be produced in advance of, and without ex-ante links to, the debits they compensate for, and stored over time*" (Eftec/IEEP et al. 2010). Habitat banking thus enables "biodiversity credits" to be generated by landowners who commit to enhance and protect biodiversity values on their land through a habitat banking agreement, allowing offsets to be turned into assets that can be traded, creating a market for developers' compensation liabilities. Credits can be bought by developers to counterbalance (or offset) the impacts on biodiversity values that are likely to occur as a result of their development (NSW Government 2012; GHK et al. 2013). Actions that create credits include the

restoration or creation of habitats or measures that enhance the viability of species populations (e.g. removal of alien predators). They can also include the protection of valuable habitats that are at risk of loss or degradation (so-called risk aversion offsets). However ensuring the additionality*³ that these latter actions may provide is usually very difficult and therefore such offsets are not normally appropriate (Tucker et al., 2014).

In the case of offsets, the debits (due to biodiversity degradation) and credits (the compensation measures) need to be matched for each case (even though offset delivery may be undertaken in a single location to satisfy demand for more than one offset requirement). This is not the case in habitat banking, where offsets are not necessarily designed to match a specific debit at the time of creation and the offsets can be stored until they are selected to compensate for a specific impact. Once this has happened they do of course still need to fulfil equivalence requirements (i.e. be like for like or better) for the debit they are subsequently used to compensate for. The independence in the timing of credits from debits at the creation stage is the key feature distinguishing habitat banking from offsets (Eftec/IEEP et al. 2010).

It is thought that by creating a more efficient compensation mechanism, habitat banking could lead to better enforcement of compensation requirements where previously impracticalities or cost concerns were a barrier. Also, it could lead to the implementation of larger compensation measures, which could contribute more effectively to overall ecosystem resilience (Ibid).

The market failure habitat banking attempts to address is one of missing markets for biodiversity conservation. Therefore, rather than altering an existing market (as a tax or subsidy does), it creates a new market through regulation (eftec et al. 2010). The optimal design, in economic terms, is one that strikes the right balance between a market that gives the buyers and sellers sufficient freedom to remain attractive and a regulated market that ensures that the potential risk factors are mitigated against (Eftec/IEEP et al. 2010). Indeed, practical evidence suggests there are a range of important risks associated with such systems. Well-established general ecological knowledge, and some supportive evidence, indicates that a policy shift that allows losses of particular biodiversity components to be systematically offset by gains in different biodiversity components (or even ecosystem services), without appropriate safeguards, could entail a significant net loss of biodiversity and ecosystem services, and associated human benefits. The main reasons for this are the following (Tucker et al. 2014):

- difficulties, or sometimes impossibilities, of restoring or creating ecosystems, habitats for species and ecosystem services adequately in other locations (BBOP, 2012a; Hossler et al, 2011; Mack and Micacchion, 2006; Maron et al, 2012; Palmer and Filoso, 2009; Quigley and Harper, 2006; Suding, 2011);
- problems with ensuring and demonstrating additionality (ie that activities that are taken to compensate for impacts provide outcomes that are additional to those that would have occurred anyway, see EFTEC & IEEP, 2010)
- difficulties of ensuring equitable outcomes when biodiversity and ecosystems are changed or moved, as many benefits will be lost if their sources are relocated, even over short-distances (Ruhl and Salzman, 2006);
- time-lags that commonly occur between impacts and the outcomes of compensation measures (Gibbons and Lindenmayer, 2007; Maron et al, 2012; Morris et al, 2006); and
- difficulties with reliably measuring the complex multi-dimensional, context-specific and dynamic values of biodiversity and ecosystem services in a practical and transparent way that can ensure damage is properly measured and then fully and equivalently

³ Terms marked with an asterisk can be found in the Glossary at the end of the document.

compensated for (BBOP, 2012b; Gardner and von Hase, 2012; Maron et al, 2012; McCarthy et al, 2004; Quétier and Lavorel, 2011; Salzman and Ruhl, 2000).

Such problems can to some extent be overcome by strong regulations, appropriate exchange rules and the use of adequate metrics for assessing gains and losses (Bull et al, 2013; Gardner & von Hase, 2012; Gardner et al, 2013) but the extent to which such framework conditions can be guaranteed is a subject to debate (Tucker et al. 2014).

The eco-accounts schemes in Baden-Württemberg, which shares many features with habitat banking schemes, will be looked into in this report, in particular to see whether if and how its design addresses the above described risk factors. This is meant to contribute to the development of a better understanding of the potential role of habitat banking schemes in implementing the NNL principle and meeting associated targets.

3 RESEARCH HYPOTHESIS INVESTIGATED AND RESEARCH METHODOLOGY

3.1 Aim and choice of the case study

The ambition of this research project is to explore to what extent offsetting, in particular via habitat banking schemes, could contribute to meeting objective 2 of the EU Biodiversity Strategy to 2020.

A recent assessment of habitat banking schemes in the EU concluded that Germany is the EU country from which the strongest demand for compensation arises (GHK et al. 2013, Tucker et al. 2013). Germany indeed appears to be one of the countries in Europe which has, since 1976, some of the most stringent requirements in place as regards the offsetting of residual impacts on the environment⁴, arguably similar to those that could be derived from EU's NNL requirement. In addition, due to its federal structure and the allocation of competencies between the national and the regional (Länder-) level, substantial experience has been gathered over the years across the country, which also illustrates regional variations in implementing the requirement.

This case study focuses on the implementation of the NNL requirement through the setting up of eco-accounts in the German region of Baden-Württemberg. This region was chosen because, besides having over a decade of experience in setting up and managing such eco-accounts at municipal level to comply with 1998 amendments of the building legislation, in 2011 it adopted a legal framework to set up such eco-accounts to comply with amendments in the national nature protection legislation. The 2011 scheme built both on the experience gathered in using the building law eco-accounts and the experience in other regions (Länder), which have introduced such schemes earlier. Hence, although Baden-Württemberg has not always been, amongst German Länder, a first mover in this field, its framework has been designed with the objective in mind of effectively addressing the problems that arose in implementing the schemes developed earlier in other regions.

3.2 Research hypotheses and methodology

While no offsetting principles or performance criteria have been published for Germany the European Parliament urged the European Commission in 2012 to “develop an effective regulatory framework based on the NNL initiative, taking into account the past experience of the Member States while also utilising the standards applied by the Business and Biodiversity Offsets Programme (BBOP)⁵”. The UK Department for the Environment, Food and Rural Affairs (Defra) also established a range of principles which offsetting schemes should incorporate (Baker et al. 2014). A look at Defra's and the BBOP's principles suggest that there are at least five principles that would appear to be of particular relevance in the context of this case study:

1. The scheme improves the effectiveness of managing compensation for biodiversity loss;
2. The scheme leads to expanded and restored habitats, not merely protecting the extent and condition of what is already there;
3. The offsets delivered by the scheme contribute to enhancing an ecological network by creating more, bigger, better and joined areas for biodiversity;
4. The scheme provides additionality*; it is not being used to deliver something that would have happened anyway;
5. The scheme results in the creation of habitat which lasts in perpetuity.

These principles appear to be equally applicable to Germany and were therefore used, together with the list of risks and problems identified in section 2.2., as a basis for the research hypothesis of this

⁴ In most Member States compensation tends to be required only in particular circumstances, for example where protected areas or other important sites are affected (GHK et al. 2013).

⁵ The BBOP Principles on Biodiversity Offsets can be found on: http://bbop.forest-trends.org/documents/files/bbop_principles.pdf

study. The objective is to explore whether eco-accounts schemes in Baden-Württemberg are suitable tools to support the implementation of the NNL principle. The different research hypotheses underpinning this research are the following:

- (a) Offsetting as implemented through the eco-accounts established in Baden-Württemberg implements the polluter-pays principle (internalises the costs of biodiversity loss) and encourages developers to reduce impacts on biodiversity⁶;*
- (b) They do not lead to a weakening of adherence to the mitigation hierarchy through a tendency to compensate for impacts where this has a lower cost than appropriate avoidance or reduction measures (i.e. becoming a 'license to trash');*
- (c) They are a transparent and fair tool for compensating for unavoidable residual impacts through measures that provide measurable additional long-term benefits;*
- (d) They are a more cost-efficient way to compensate for biodiversity/habitat loss (and comply with no net loss requirements) than the traditional approaches developers could take to meet the requirements under the Impact Mitigation Regulation.*

This report is therefore a contribution to the discussion around the potential role of habitat banking in implementing the EU NNL objective. Where possible, it highlights relative advantages, disadvantages and costs of habitat banking compared to other, less flexible means of meeting offset requirements.

A more in-depth verification of this case study's research hypotheses would ultimately have required comparing traditional (mostly on-site) residual impact compensation by developers under the Impact Mitigation Regulation ("Eingriffsregelung") with the kind of compensation measure that have been implemented under the eco-account schemes. While this goes beyond the scope of this case study, throughout this work the question of the cost-efficiency of the eco-accounts approach with respect to a traditional approach was explored. In particular, whenever possible, insights have been sought on (a) the costs involved for different types of actors in both approaches and (b) the environmental/biodiversity benefits achieved in both approaches (to the extent to which is possible).

The research team has adopted a qualitative approach to collect information and views from different stakeholder groups on whether or not the eco-account schemes in place in Baden-Württemberg effectively fulfil the above-mentioned requirements. The information has been collected through a literature review and semi-structured interviews with a broad range of stakeholders involved in the implementation of the eco-accounts schemes (see Annex I for an example of the questionnaire). The questions and stakeholder to be interviewed were identified in a preliminary literature review. The first round of interviews allowed the identification of specific examples of eco-accounts that were analysed, as well as of a broader range of stakeholders to be interviewed in the course of the field work. Structured interviews were conducted with experts/academics, compensation agents, local administrative authorities and third parties (environmental NGOs, Regional farmer association, mining association, etc.). A full list of interviewees can be found in Annex I and an example of the standard questionnaire used in Annex II.

⁶ This hypothesis implies that there is much scope for developers to minimise the costs from mandatory offsetting by (a) taking the ecological value of land into account when choosing where to locate their developments and (b) ensure due mitigation of impacts through careful design of a development.

4 OFFSETTING IN GERMANY

4.1 The German Impact Mitigation Regulation (IMR)

The demand for off-setting in Germany primarily arises from the Federal Impact Mitigation Regulation (“Eingriffsregelung” or “Eingriffs-Ausgleichs-Regelung”) adopted via the Federal Nature Conservation Act in 1976, which deals with the mitigation and compensation of impacts on nature and landscape, including those outside protected areas (Wende et al. 2005). The IMR is consistent with the “polluter-pays-principle” and introduces a number of duties for developers that are obliged to avoid avoidable impacts on nature and the landscape and to offset any residual impacts in view of preserving at least the status quo as regards ecosystem functions and landscape features. Furthermore, the IMR defines that an impact is offset when, after the mitigation and compensation measures took place, no considerable or enduring damages on the ecosystem remain or the landscape appearance is restored consistently [...] (personal translation, BNatSchG 1976⁷: §8 (2)). The “avoidance principle” included in the IMR calls for impact avoidance and mitigation to be given priority over impact compensation which, in line with the mitigation hierarchy, has to remain a next-to-last solution in case of residual impacts (personal translation, BNatSchG 1976: §8 (3)). The IMR establishes that a development may not be approved or carried out if the impacts cannot be avoided or appropriately compensated and nature conservation and landscape management objectives appear to take precedence over other considerations (BNatSchG 2009; §15 (5)). However, a reference to a “weighting process” to reach such a decision also implies that a development resulting in such impacts may still be approved if the weighting process concludes that the economic benefits outweigh nature and landscape conservation considerations.

The 2009 version of the IMR distinguishes so called “restoration measures” (“Ausgleichsmaßnahmen”) and “replacement compensation measures” (“Ersatzmaßnahmen”) which in the following are both referred to interchangeably as off-setting or compensation measures. The former refers to a direct spatial, functional, and timely connection between development and compensation (“in-kind” and “on-site”), ensuring equal ecological functioning and values of the concerned ecosystem. The latter does not necessarily refer to the restoration of the exact same functions on-site and thus allows for more spatial and functional flexibility („out-of-kind“ and „off-site“). According to the technical criteria anchored in the Nature Conservation Act, compensation needs to be of same type (“gleichartig”; “in-kind”) or of same value (“gleichwertig”; “out-of-kind”) (BNatSchG 2009: §15 (2)). While restoration compensation is usually preferred over replacement compensation there is not a strict requirement enshrined in the legislation to prefer one over the other (§15 (2)). If it is not possible to compensate via “restoration measures” or “replacement compensation measures”, compensation payments are foreseen as a solution of last resort within the IMR’s mitigation hierarchy (BNatSchG 2009: §13).

Legally, the developer is responsible for planning, financing and implementing the necessary avoidance, mitigation and compensation measures. Therefore, in the context of administrative procedures, the developer needs to submit to authorities a so called “accompanying landscape conservation plan” (“Landschaftspflegerischer Begleitplan”) outlining what measures he/she intends to implement (BNatSchG 1976: §8 (4)).

It is worth highlighting that there is no single legislative text that corresponds to the “Impact Mitigation Regulation”. What is referred to as the “Impact Mitigation Regulation” is in fact the set of rules that can be derived from a range of legal requirements governing the compensation of impacts

⁷ The Federal Nature Conservation Act 1976 refers to the following German translation “Gesetz über Naturschutz und Landschaftspflege – Bundesnaturschutzgesetz (BNatSchG)” and has been adopted on 20th December 1976.

across different pieces of legislation (most if not all of which are to be found in the Nature Conservation Act (Peters 1996), and in the Federal Building Code.

4.2 Challenges in implementing the IMR and legal responses

4.2.1 Implementation challenges with the IMR

Recent years have seen an increased development and use of formalised offset and habitat banking schemes across Germany. These have been established in order to facilitate the implementation of the IMR and in particular help developers meet their obligations to achieve no net loss in more flexible and effective ways. In part, their introduction was driven by a number of challenges and concerns in implementing the IMR:

1. According to a whole range of studies focused on the building planning in the late 1990s and early 2000s, only a limited number of compensation measures were actually carried out (personal communication, University for Economics and Environment Nürtingen-Geislingen: Mr. Prof. Dr. Küpfer; Tischew et. al 2010; Jessel 2006; Rexmann et. al 2001). This **implementation deficit** of compensation measures resulted at least in part from the limited availability of suitable land close to the development whose residual impacts had to be compensated and from an unclear allocation of responsibility as regards monitoring and control of the compensation measures. In addition, there were instances of **double allocation of compensation measures** due to a lack of transparency and overlapping planning tools, i.e. the missing integration of compensation measures into a spatially encompassing concept ("räumliches Gesamtkonzept") (personal communication, urban administration of Heidelberg: Mr. Schäfer; LNV/NABU 2009: 2; Spang/Reiter 2005: 32).
2. Tensions between different land using stakeholder groups, fuelled by an increasing demand for land to carry out compensation measures, lead to difficulties in enforcing legally satisfactory implementation, use, management and control of compensation measures (Schmidt-Lüttmann 2012; Spang/Reiter: Ibid). The requirement for rather **strict spatial and temporal connection** between impact and compensation frequently resulted in costly attempts for on-site compensation to be carried out at the same time as the impacts arose (Pfaffenberger/ Sedlak 2011).
3. A rising need for legal certainty through the establishment of standardized, uniform evaluation systems to avoid the legal uncertainty resulting from the **coexistence of various approaches to the offsetting of residual impacts and different evaluation models**. These arose in particular at the local level, as a result of the time gap between the adoption of a legal framework on a national and regional level and the emergence of operational tools on a local level (personal communication, University for Economics and Environment Nürtingen-Geislingen: Prof. Dr. Küpfer, municipality of Villingen-Schwenningen: Mr. Schott).

More generally, planning authorities were however often confronted with a lack of quality regarding compensation measures and developers were confronted with additional complications regarding legal procedures (Küpfer 2008). Thus, all in all, there were difficulties in ensuring legally satisfactory implementation, management and control of compensation measures. In this context, a modified legal framework became necessary and the legal obligation to distinguish between restoration and replacement compensation was loosened, creating the conditions for the emergence of eco-account as tools to make the implementation of the requirements of the IMR more operational.

4.2.2 Legal modifications to overcome these challenges

Legal changes to the Building Code and the Nature Conservation Law

In 1998 amendments to the Federal Building Code optimising the enforcement and implementation of compensation measures in urban development planning were adopted. These introduced spatial flexibility for developers having to carry out compensation measures for their developments (BauGB 1998: §1a (3) in relation to §200a). Besides the geographical disconnection between impact and offsetting, a temporal flexibility was introduced for municipalities allowing them to carry out compensation measures before any impact arises (BauGB 1998: §135a (2)). 2004 amendments of the Building Code define more precisely the location of compensation measures (BauGB 2004: §9 (1a)) (for further details see 6.3.2 (Geographical dimension of implementing compensation measures)).

The aforementioned spatial and temporal flexibility created the conditions for the development of “compensation (area) pools”^{*} and ultimately the emergence of formalised eco-account schemes under the building law. The introduction of such “compensation pools” led to the need for, and development of, professional public and private providers of compensation services (“compensation agencies”^{*}).

Subsequently, the temporal and spatial flexibility for compensation measures found its way into the nature protection legislation, first at Federal, then at the states (Länder-)level.

In **2002, amendments to the Federal Nature Conservation Act** introduced more spatial and temporal flexibility in the implementation of the requirements relating to the offsetting of residual impacts on nature and the landscape under the IMR (Schmidt-Lüttmann 2012). Furthermore, those 2002 amendments clarify the allocation of competences between the federal and the Länder level: Länder are given the competence to adopt further regulations to specify the definition of impact and to ensure the implementation of compensation measures (BNatSchGNeureg⁸ 2002: § 18 (3-4)).

In addition, an **amendment to the Federal Nature Conservation Act in 2009⁹** introduced the possibility of “storing offsetting measures” (BNatSchG 2009: §16), i.e. setting out that anticipated interventions (i.e. restoration measures) may be recognized as compensation measures if they fulfil specific criteria (for more information see section 7.3.1/5.3.1 Criteria for compensation measures to enter the scheme). It is the first time that the term “eco-account” (“naturschutzrechtliches Ökokonto”) is mentioned in German legislation. Due to Germany’s federal system, the Federal Nature Conservation Act foresees that the Länder make use of their competencies to adopt further legislation regulating eco-accounts, compensation pools and other measures shall be determined (BNatSchG 2009: §16 (2)).

Non-legal responses for better implementation

Besides the legal responses to the challenges mentioned in section 4.2.1 in implementing and enforcing the commitments under the IMR, a range of non-legal initiatives were also taken.

The German Federal Association of Compensation Agencies¹⁰ developed quality standards for the work of compensation agencies and the establishment of compensation pools for environmental

⁸ The 2002 amendment is called „Gesetz zur Neuregelung des Naturschutzes und der Landschaftspflege und zur Anpassung anderer Rechtsvorschriften (BNatSchGNeuregG)“ in German and has been adopted on 25th March 2002.

⁹ The 2009 amendment refers to the following German law „Gesetz zur Neuregelung des Rechts des Naturschutzes und der Landschaftspflege“ and has been adopted on 29th July 2009. In our paper we use the abbreviation „BNatSchG 2009“.

¹⁰ Bundesverband der Flächenagenturen in Deutschland e.V. (BFAD)

conservation purposes (BFAD 2008a). According to these, compensation pools and agencies can be officially recognised if they fulfil a series of criteria including:

- Ensuring enhancement from a nature conservation perspective;
- Safeguarding areas and measures over the long term;
- Monitoring and follow up of the development of the pool areas;
- Integration of offsets into other strategies and instruments;
- and compliance with high performance standards (BFAD 2008b).

Due to the principle of allocation of competencies, the national legal framework does not provide any guidance for the evaluation models to be used in order to ensure equivalence between the impacts and the offsetting measures. The development of such guidelines is a competence of the Länder. These have generally produced guidelines on how compensation should be calculated in view of ensuring consistently high quality standards of the offsetting measures.

This chapter presented the overall policy framework and the policy developments that have triggered and influenced the development of approaches and instruments at the regional level across Germany. The next one presents in more detail the implications of this evolving policy-framework on the eco-accounts schemes in Baden-Württemberg.

5 CONTEXT OF THE ECO-ACCOUNTS SCHEMES IN BADEN-WÜRTTEMBERG

5.1 Eco-accounts: Establishment of an enabling legal framework on a regional level

In Baden-Württemberg eco-accounts established under the Federal Building Code and those established under the Nature Conservation Act co-exist. In the following text, statements can be assumed to apply to both eco-accounts unless specified otherwise.

The revision of nature protection legislation in Baden-Württemberg (“Naturschutzgesetz Baden-Württemberg” - NatSchG BW)¹¹ in 2005/2006 was taken as an opportunity to **reiterate which impacts are targeted by the legislation** (e.g. modification of the soil structure, development or major changes to building developments, roads and the removal of water bodies) (NatSchG BW 2005: § 20 (1)). The use of soil for agriculture and forestry are excluded from the impacts to be compensated as long as it is done in compliance with relevant legislation. It also defines the **requirements for a compensation measure to be recognised as an eco-account (compensation) measure** that may be used for the compensation of future impacts. According to the regulation, in order to qualify a compensation measure has to have been previously approved by nature conservation authorities, should not have been implemented in order to meet some other legal obligation and has to be carried either to offset one’s own impacts or those of another party. Also, it needs to show a long-term favourable effect on the performance and functionality of the ecosystem and landscape (NatSchG BW 2005: § 22 (1)). This nature conservation law introduced also the requirement for nature protection authorities to establish a “compensation registry” in view of improving the administration, transparency and long-term monitoring of compensation measures (NatSchG BW 2005: § 23 (7)).

This revision also **created the possibility to establish eco-accounts schemes** in view of meeting the requirements under the Impact Mitigation Regulation and the Federal Nature Conservation Act (as revised in 2002 and 2009).

The revision of the nature conservation legislation in Baden-Württemberg also **called on the regional administration to develop a proposal to act** on (1) the management of eco-accounts and the approach to dealing with requests for crediting compensation measures and (2) the establishment of a compensation registry to record the land set aside for offsetting and compensation measures, as well as the relevant measures themselves (Schmidt-Lüttmann 2012). While the former was meant to regulate the procedure, competencies, evaluation and crediting of anticipated compensation measures under an eco-account scheme, the latter was meant to specify how a registry of compensation measures would be managed.

The revisions also announced the establishment of two working groups to support the development of the regulations and to deal in particular with:

- compensation measures assessment methods and
- development and trial of an internet-based system to ensure easy to manage application, approval and management of the compensation measures

¹¹ Official German designation of the nature conservation law in Baden-Württemberg is „Gesetz zum Schutz der Natur, zur Pflege der Landschaft und über die Erholungsvorsorge in der freien Landschaft“. It has been adopted on 13th December 2005 and has been coming into force on the 1st January 2006.

Following an intensive stakeholder consultation and test phase, the relevant implementing acts, i.e. the “Act (...) on the management of compensation registries” (KompVzVO)¹² and the “Act (...) on the recognition and crediting of anticipated measures for the compensation of impacts from developments” (ÖKVO)¹³ were adopted. They introduced the eco-accounts under the nature legislation (“naturschutzrechtliches Ökokonto”) in Baden-Württemberg. Adopted in late 2010/ early 2011, those acts set out the rules governing the eco-accounts and in particular the conditions for approval and listing of anticipated compensation measures in the compensation registries (Schmidt-Lüttmann 2012: 4-6).

5.2 History of the schemes: From the first experiences with eco-accounts under the building law to 2010/2011 eco-accounts under nature conservation law

5.2.1 Establishment of the building law eco-accounts

Following the possibility for setting up eco-accounts under the Federal Building Code¹⁴ (“baurechtliches Ökokonto”) at municipal level, introduced through the 1998 revision, municipalities started seeking support and advice on how to introduce such municipal eco-accounts. In 2002, the former regional authority for Environment Protection in Baden-Württemberg (“Landesanstalt für Umweltschutz Baden-Württemberg (LfU)”) ¹⁵ saw an opportunity to set up the pilot project “eco-account in Baden-Württemberg” in cooperation with the former regional Ministry for Food and Rural Area. This first pilot project (see box below) resulted in the formulation of recommendations at regional level.

Table 5.1: The first pilot project “eco-account in Baden-Württemberg”

The pilot project, which ran from 2002 to 2005, aimed mainly at helping the 1.111 municipalities in Baden-Württemberg to gather experience and develop guidance for the implementation of the IMR and the establishment of eco-accounts on a municipal level and in order to help develop a more standardized and legally secure framework. The pilot project was characterised by three development phases:

2002	Determination of the municipalities’ needs for information and support
2003/ 2004	Development of workshops between different stakeholder groups and establishment of different offers of information (e.g. development of the evaluation model for compensation measures and residual impacts, software tools for land and compensation measure management as well as an Internet platform)
2004/ 2005	Test and implementation phase of developed eco-account tools by 24 selected municipalities
2005	implementation of the evaluation guidelines „model for the evaluation of impacts and compensatory measures in urban development plannings under the building law“, including the model for evaluation of biotopes („Empfehlungen für die Bewertung von Eingriffen in Natur und Landschaft in der Bauleitplanung sowie Ermittlung von Art und Umfang von Kompensationsmaßnahmen sowie deren Umsetzung“ and „Bewertung der Biotoptypen Baden-Württembergs zur Bestimmung des Kompensationsbedarfs in der Eingriffsregelung“, LfU 2005)

Sources: based on Schmidt-Lüttmann 2012: 4-6; Schmidt-Lüttmann 2005: 206 – 223

¹² The compensation registry regulation refers to the following German translation „Verordnung des Ministeriums für Umwelt, Naturschutz und Verkehr über die Führung von Kompensationsverzeichnissen (Kompensationsverzeichnis-Verordnung – KompVzVO“ and was adopted on 17th February 2011.

¹³ The eco-account regulation refers to the following German translation „Verordnung des Ministeriums für Umwelt, Naturschutz und Verkehr über die Anerkennung und Anrechnung vorzeitig durchgeführter Maßnahmen zur Kompensation von Eingriffsfolgen“ (Ökokonto-Verordnung – ÖKVO) and was adopted on 19th December 2010.

¹⁴ Especially via the following articles §135a (2) and § 200a.

¹⁵ In 2006 this institution was renamed as regional authority for Environment, Measurements and Nature Protection (“Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg LUBW”).

Since this pilot project, the experiences with and insights from using eco-accounts were useful in developing the eco-account under the nature legislation.

5.2.2 Establishment of the eco-account under nature conservation law

Starting 2006 working groups started working on technical and legal aspects of the eco-accounts regulation. Between 2008-2010, a second pilot project preparing for the implementation of the eco-account under the nature legislation was set up by the former Ministry for Food and Rural Area of Baden-Württemberg in cooperation with the regional association “Regionalverband Schwarzwald-Baar-Heuberg” and its related districts and municipalities, the industrial association of the pit and quarry industry¹⁶ and six selected firms, under scientific steering of the University for Economics and Environment Nürtingen-Geislingen.¹⁷ The main purpose of this pilot project was for the principles established in the regulation and the associated online tool to undergo a trial run. Similar to the first pilot project, multiple stakeholder groups were involved in the development phase of this eco-account scheme. Not only nature conservation authorities and further specialised authorities, but also nature conservation NGOs and other interest groups therefore had an opportunity to raise their views early on in the process. Table 5.2 provides an overview of the different stakeholder groups involved in the development phase of the eco-account under nature conservation law in Baden-Württemberg.

Table 5.2: Different stakeholder groups involved in the development phase of the eco-account under nature conservation law in Baden-Württemberg	
Nature conservation authorities:	<ul style="list-style-type: none"> • Lower Nature conservation authority • Middle Nature Conservation authority • Upper Nature Conservation authority • LUBW
Specialised administrative authorities:	<ul style="list-style-type: none"> • Supreme water authority • Supreme Soil protection authority • Supreme agriculture authority • Supreme forest authority
Nature protection groups (NGOs):	<ul style="list-style-type: none"> • Landesnaturschutzverband Baden-Württemberg e.V. (LNV) • Bund für Umwelt und Naturschutz Deutschland e. V. (BUND) • Naturschutzbund Deutschland e. V. (NABU)
Other interest groups:	<ul style="list-style-type: none"> • Industrieverband Steine und Erden Baden-Württemberg e.V. (ISTE) • Verband der Baden-Württembergischen Grundbesitzer e. V. • Badischer Landwirtschaftlicher Hauptverband e. V. (BLHV) • Forstkammer Baden-Württemberg – Waldbesitzerverband e.V.

Source: Illustration by JS based on Schmidt-Lüttmann, 2012: 5

The eco-account regulation adopted in 2011, framing the eco-account under nature conservation law in Baden-Württemberg, is based on the tools developed for the eco-account under the building law. In the course of the development phase of the eco-account under nature conservation law the requirements for the evaluation and account management changed too much for allowing a direct compatibility between both schemes, thus resulting in both types of eco-account scheme co-existing alongside each other in Baden-Württemberg (LUBW 2013a).

The broad participation and integration of a wide range of stakeholders potentially concerned by the eco-account scheme were ensured already in the early development phase of both eco-accounts in Baden-Württemberg. This “cooperative project design” (Schmidt-Lüttmann 2005: 208), by fostering a

¹⁶ “Industrieverband Steine und Erden Baden-Württemberg e. V.”

¹⁷ “Hochschule für Wirtschaft und Umwelt in Nürtingen-Geislingen”

consensus beyond the formal legislative process, can be considered as a key element having created the condition for a successful implementation of the tool. Interviewees confirmed that the early integration of concerned stakeholders into the development process avoided the emergence of a “blocking power” in later steps, including the implementation phase.

The participative approach adopted was therefore characterised by a mixture of bottom-up strategy based on local level interest groups and actors, and a top-down approach with a steering role for the upper administrative level (e.g. regional ministries, LUBW) establishing the legal framework (Bruns 2007).

6 THE RULES OF THE SCHEMES IN PLACE IN BADEN-WÜRTTEMBERG

This chapter looks into the framework and rules governing the implementation of habitat-banking schemes supporting the offsetting of residual impacts in the German Land of Baden- Württemberg.

6.1 An overview: Basic principles of the eco-accounts' functioning

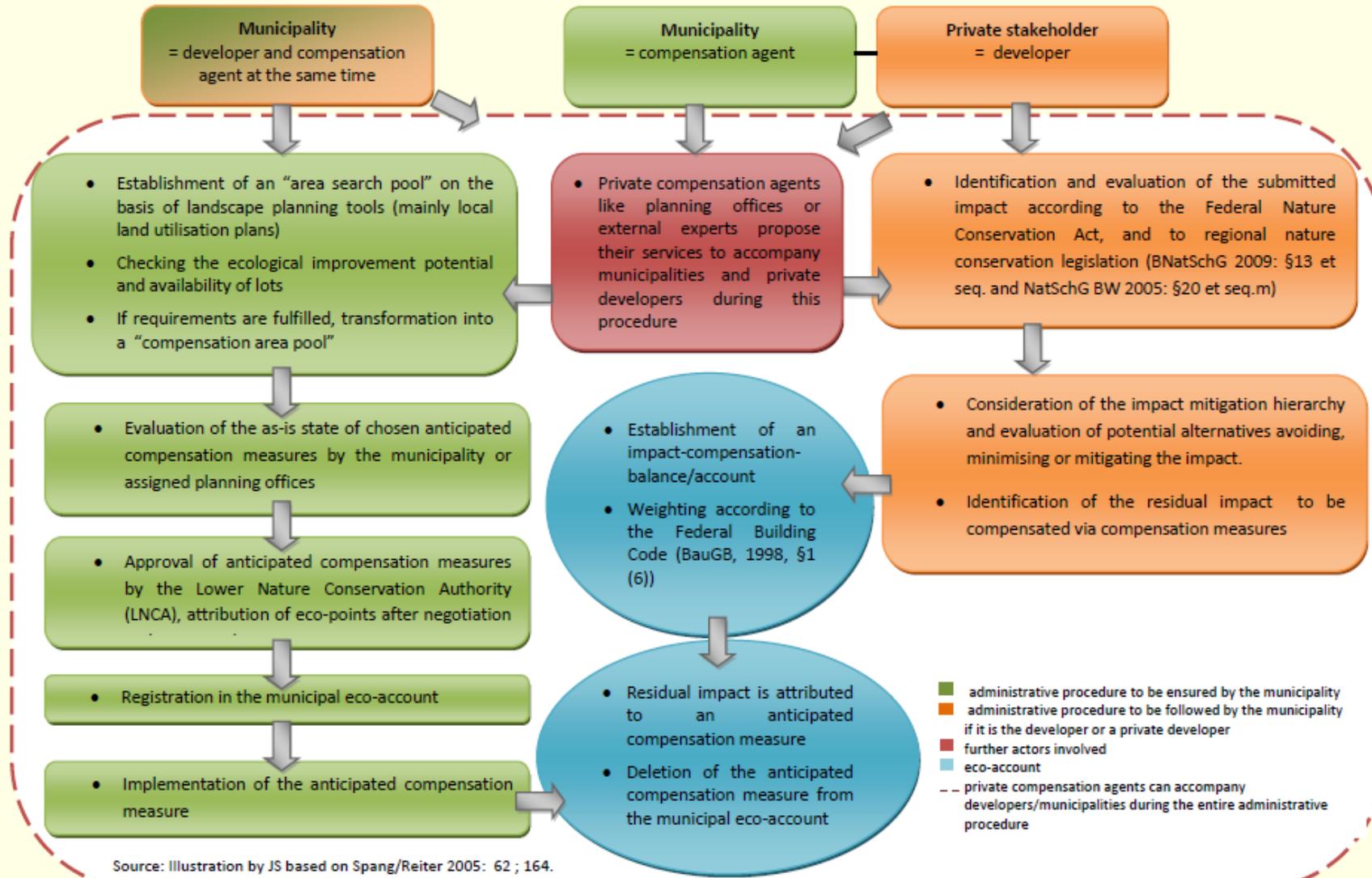
6.1.1 *The eco-account under the building law (“baurechtliches Ökokonto”)*

The eco-account under the building law is managed at the municipality level. They are used to compensate residual impacts arising from developments the municipality itself is responsible for. However in certain cases they can also be used for developments carried out by private investors, provided that the impact takes place in an area defined by building planning tools. The anticipated compensation measures for residual impacts are usually implemented within the municipal boundaries, even though they can also occasionally be carried out in neighbouring municipalities.

In the eco-account under the building law, appropriate lots (with high ecological improvement potential and available for off-setting) are transferred to a compensation pool/pool of appropriate lots*. As soon as an anticipated compensation measure on one of these lots is realized, it can be credited to the eco-account. Subsequently, this compensation measure can be attributed to residual impacts (Küpfer 2008: 1; Küpfer 2012: 2 et seq.). Eco-points are attributed both to the compensation measures within the compensation pool and to residual impacts. A residual impact is to be compensated via a compensation measure with an equivalent number of points. As in most cases the municipality acts simultaneously as the developer and compensation agent, financial transactions are rare. Indeed, under this type of eco-account municipal authorities create mostly a compensation pool to compensate impacts of developments they are responsible for.

Due to the local administration of this type of eco-accounts, a variety of evaluation models regulating the attribution of eco-points to residual impacts and compensation measures are used (see section 6.5 for more on the role of evaluation models). There usually is no interest payment to reward the anticipated implementation of compensation measures but exceptions exist and newly established building law eco-account are more likely to include interest payments as they are more likely to be inspired by regulation establishing the eco-account under the nature conservation law.

FUNCTIONING OF THE ECO-ACCOUNT UNDER THE BUILDING LAW



6.1.2 Eco-accounts under the nature conservation legislation (“naturschutzrechtliches Ökokonto”)

The eco-accounts under nature conservation law were historically largely inspired by the eco-accounts under building law. Some of the mechanisms, such as the one for the identification of suitable land, are therefore very similar.

Contrary to the eco-account under building law, however, the eco-accounts under nature conservation law are managed by the lower nature conservation authorities (LNCAs) (“Untere Naturschutzbehörden”), which are usually on a district level (“Stadt-und Landkreis”). The LNCAs are responsible for introducing and administering compensation registries at the level of the district. These registries may include both:

- (1) compensation measures that are already attributed to impacts from a specific development and
- (2) anticipated compensation/eco-account measures that have been approved by the LNCA. These are credited to the eco-account but not yet attributed. The information includes habitat type, the original state of the area (+ associated eco-points), as well as the description of the state after the implementation of compensation measure (+ associated eco-points).

This information is to be made available to the public (KompVzVO 2011: §§1-3). “Compensation agents” (“Maßnahmenträger”) submit to the LNCAs applications for their compensation measures to be listed under the approved anticipated compensation /eco-account measures in the compensation registry (“Kompensationsverzeichnis”).

These eco-accounts are primarily used to compensate residual impacts arising from developments in areas not covered by a (legally binding) land development plan (“Außenbereich”), e.g. developments linked to public utility infrastructure projects (like road construction and projects related to provision of gas, electricity, water, etc.).¹⁸ The trading of eco-points between developers and compensation agents is possible as long as compensation measures and impacts are located in the same habitat area (see section 6.3.2). A standardized evaluation model (see section 6.5.2) to attribute eco-points to compensation measures and impacts has been developed by authorities at regional level (in Baden-Württemberg) and its use is recommended.

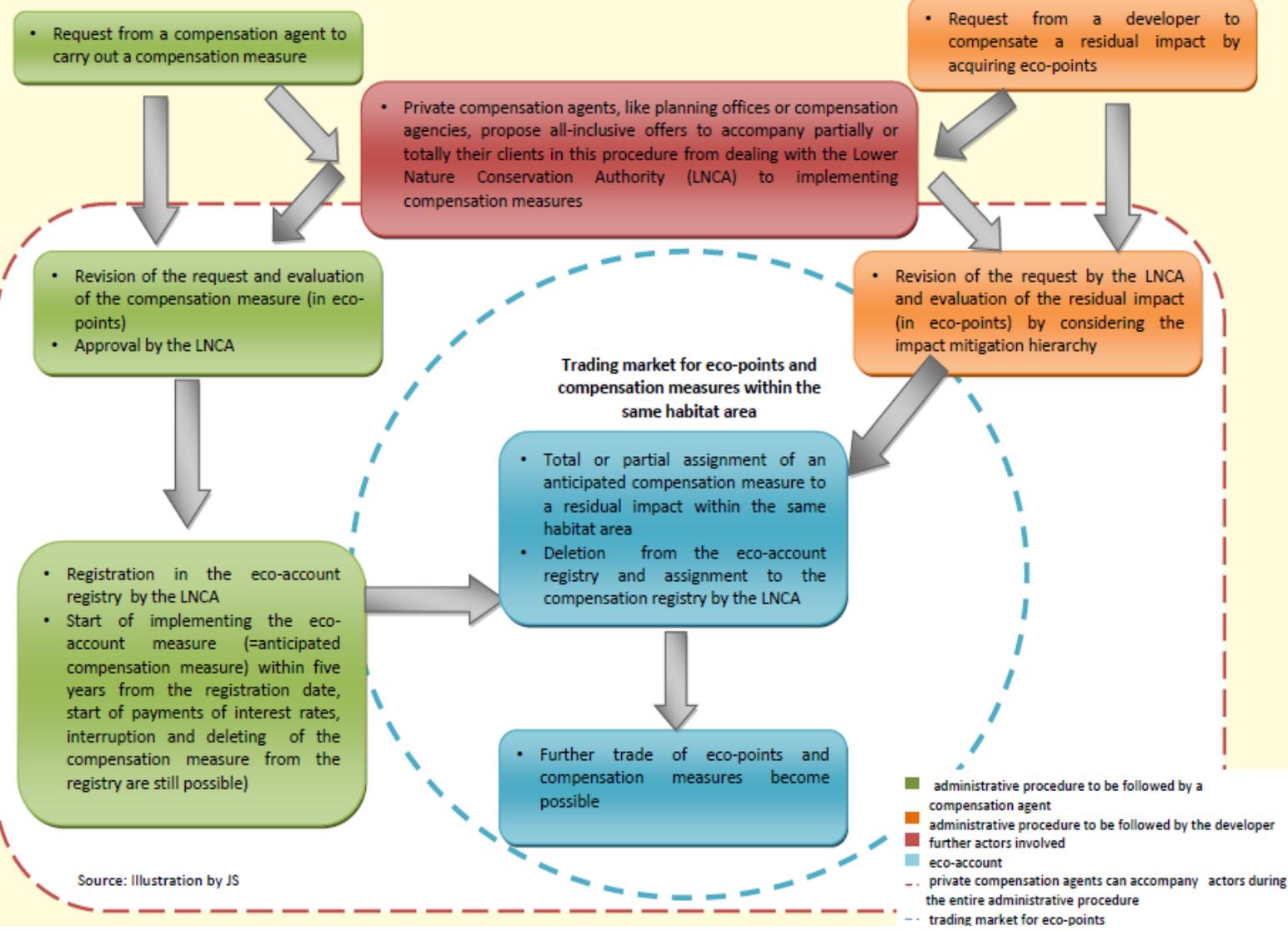
An interest payment of 3% per year on registered compensation measures that have already been implemented is meant to incentivize compensation agents to use the eco-account scheme to implement anticipated compensation measures.

Private compensation agents, like compensation agencies and planning offices, offer service packages to accompany partially or totally both developers and compensation agents during administrative procedures.

A comparative table analysing the two different types of eco-accounts co-existing in Baden-Württemberg can be found in ANNEX III.

¹⁸ The scope of application is regulated by the Federal Building Code (BauGB 1998: §35).

FUNCTIONING OF THE ECO-ACCOUNT UNDER NATURE CONSERVATION LAW



Source: Illustration by JS

6.2 Eco-accounts: a voluntary scheme to meet the obligation to compensate impacts

The eco-accounts are completely voluntary schemes, which developers may or may not decide to use to offset the residual impacts of their developments. Developers are, however, in no case free to decide whether or not they are going to compensate the residual impacts. Developers may also decide to fulfil their obligations under the IMR not using the eco-accounts, but using however the evaluation models created for the eco-account scheme (personal communication, University for Economics and Environment Nürtingen-Geislingen: Mr. Prof. Dr. Küpfer; FVA-BW: Mr. Dr. Waldenspuhl).

The eco-account regulation on a regional level further specifies that, although the planning and implementation of anticipated compensation measures is voluntary, measures that are listed in the compensation registry become binding as soon as residual impacts have been attributed to the anticipated compensation measure (ÖKVO 2011: §6 (2)).

6.3 Scope of application of the eco-account schemes

6.3.1 Criteria for compensation measures to enter the schemes

Compensation measures are to be recognised as such if they fulfil the following criteria according to §16 BNatSchG 2009 (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety 2009: 24):

1. they respect the criteria mentioned in the IMR (§15 (2)),
2. they have been carried out voluntarily, i.e. without any legal obligation,
3. they have been entirely financed with private means, i.e. without any public funding,
4. they respect all German landscape planning tools (like landscape programmes, landscape master plans and open space structure plans as further specified in § 10-11 BNatSchG 2009),
5. they are based on available records showing the original condition of the relevant areas

The eco-account regulation in Baden-Württemberg also defines further criteria compensation measures need to meet, including:

- Eco-account measures must result in an improvement equivalent or above 10 000 eco-points and cover an area of at least 2000 m² (to avoid disproportionate administrative burden – with exceptions) (ÖKVO 2011: §3 (4)).
- Eco-account measures require the approval of the LNCA (ÖKVO 2011: §3 (1)).
- They require a certification of the availability of the chosen land/area (ÖKVO 2011: §3 (2.4))
- Measures go beyond simply ensuring preservation of the status quo (conservation of existing nature/landscape)

The same regulation also specifies that LNCAs can only approve measures for which all required information is provided and which can be attributed to one of the following assets (“Schutzgüter”) (ÖKVO 2011: §2 (1)):

- improve the quality of a given habitat,
- create high value habitats,
- support specific species,
- re-create natural retention areas,

- re-create and improve the functions of soils,
- improve groundwater quality

Compensation measures may not be accepted as anticipated compensation measures:

- a) if they are basically limited to good agricultural practices or normal forestry and fishery management practices;
- b) if they focus on conserving the state of existing nature and landscape, but do not result in an improvement of the ecological balance of an area/the natural environment (“Naturhaushalt”)
- c) if they are to be implemented in an area on which measures that would result on the ecological deterioration of the area are in the process of being permitted/have been approved (ÖKVO 2011: §2 (3)).

Uncertainties and challenges relating to the scope

The administrative requirements for compensation measures to be acknowledged for the eco-account are relatively strict. In this context, two recurrent challenges linked to the scope as it is defined in the eco-account regulation in Baden-Württemberg have been identified through the interviews with local stakeholders.

The assets (“Schutzgüter”) that the eco-account regulation seeks to protect include habitats/species alongside soil and water quality. Those three areas have been chosen due to historical experience and methodological operability whereas other areas like the evaluation of landscape appearance have not yet gone beyond a qualitative evaluation approach (personal communication, FVA-BW: Mr. Dr. Waldenspuhl).¹⁹ Climate, recreational value and landscape appearance are excluded from the eco-account regulation in Baden-Württemberg, despite being acknowledged in other legal frameworks like the IMR and the Federal Building Code²⁰. The limited scope of the eco-account regulation, which excludes the above mentioned assets (ÖKVO 2011: § 2(2) and its annex 1) is seen critically by several interest groups. For example, a representative of the LNCA suggested that a broader list of assets that would for example also include landscape scenery, would be preferable over the current rather detailed list that focuses primarily on three types of assets and excludes others (personal communication, district office of Offenburg: Mr. Müller).

On the other hand, a restricted list of acknowledged compensation measures is also thought to have a number of benefits, for example that LNCAs and planning offices can make the system work with fewer human resources: the longer and flexible the list, the more time and resource intense the approval process would be. In addition, a restricted list contributes to ensuring additionality because it restricts the scope of measures that are accepted as compensation measures to those for which additionality can be clearly demonstrated. Compensation measures that may have no additionality are explicitly excluded, such as switching to maintenance measures that conserve the status-quo as regards biodiversity, (personal communication, University for Economics and Environment Nürtingen-Geislingen: Prof. Dr. Küpfer) or measures that are already required within the principle “of good agricultural or forestal practice” (personal communication, NABU/ Flächenagentur BW GmbH: Mr. Dr. Röhl; municipality of Donaueschingen: Mr. Dr. Bronner).

A second point that has been criticised, in particular by nature conservation NGOs, is the list of 63 protected species for which eco-points may be attributed if suitable habitat is restored or created for

¹⁹ Although systematised evaluation models for landscape appearance exist in other federal states like Nordrhein-Westfalen which are partially used in Baden-Württemberg.

²⁰ The IMR seeks to protect landscape scenery and the Building Code provides the information that compensation measures counteracting the climate change or serving as adaptation to the climate change shall also be taken into consideration (BauGB 1998: § 1a (5)).

them (ÖKVO 2011: annex 2, table 2). Although special efforts to contribute to the conservation of endangered species are being “rewarded” under the eco-account under nature conservation legislation, some stakeholders questioned the length of the list of species, its scientific robustness and pointed out in particular that it fails to take into account the fact that some species might be highly endangered locally. Amongst the alternative approaches suggested was that, in addition to the list of endangered species, the status of species in specific areas should be considered as well (personal communication, Flächenagentur BW GmbH/ ISTE BW e.V.: Mr. Sedlak; NABU:Mr. Dr. Röhl). In addition, the umbrella organisation of nature protection groups in Baden-Württemberg (“*Landesnaturschutzverband Baden-Württemberg e.V.*”) claimed in 2009 that the evaluation model is overly focused on habitats and that species protection is not treated in a satisfactory manner. It suggested that biodiversity be granted more importance in the eco-account regulation (LNV/NABU 2009: 3).

It must be noted, however, that the protection of endangered species is regulated by a separate specific legal framework in Germany and impacts on protected species have also to be assessed for example in the context of an environmental impact assessment.

6.3.2 Geographical dimension of implementing compensation measures

As far as the spatial scope of the eco-accounts is concerned, the eco-account under nature conservation legislation and the eco-account under the building law need to be distinguished. The **Federal Building Code** allows for two possibilities for the location of off-setting measures (BauGB 2004: §9 (1a), §1a (3)):

- 1) on-site, i.e. on the same area on which the impact took place
- 2) off-site, i.e. either within the defined area of the building-plan where the impact took place or within another building-plan.

Thus, impacts in a municipality should be compensated via off-setting within the municipal boundaries (“*Gemeindegemarkung*”) or potentially within the boundaries of a neighbouring municipality. In practice, the geographical scope of **compensation measures under the building law eco-account** is limited to compensation measures within the municipality in which the impact took place. Legal instruments defining the area more precisely are the so-called landscape and building planning tools as well as the federal and regional building legislation.²¹

The Federal Building Code (BauGB 2004: § 35) also states that, impacts taking place in areas not covered by a (legally binding) land development plan (usually outside the municipality) should be compensated by using the eco-account under nature conservation legislation. As mentioned earlier, when using the eco-accounts under the nature conservation legislation, the compensation measures are to be carried out in the same natural area/ habitat area (“*Naturraum*”).²²

²¹ The legal framework regulating the exact scope of application of the eco-account under the building law is complex and detailed. On the one hand, the scope of application is the building planning including preparative and binding land using plans as well as special cases regulated according to the Federal Building Code (BauGB 1998:§18(1); § 34 (4)). On the other hand, two areas are excluded from its scope: Firstly, development plans according to the Federal Building Code (BauGB 1998:§ 33) and the built-up area under a (legally binding) urban development plan (“*Innenbereich*”) in the framework of the Federal Building Code §34 (according to §18BNatSchG).

²² The entire German territory is divided into natural areas/ habitat areas which were designed between 1953-1962 by the former German Federal Institute for Regional Studies (“*Bundesanstalt für Landeskunde*”) and published in the “*Handbook of Natural Region Divisions of Germany*” (“*Handbuch der naturräumlichen Gliederung Deutschlands*”). Until today this classification is used with slight changes made by the BfN in 1994. Those natural areas/habitat areas are classified into different orders. Germany is divided into four, large-scale natural areas of 1st order. The “*Land*” of Baden-

The **Federal Nature Conservation Act** 2009 does not directly specify the geographical scope of compensation measures, but it:

- 1) Introduces the term “relevant natural area/ habitat area” (“Naturraum”) (BNatSchG 2009:§15 (2))
- 2) States that the identification of suitable land for compensation measures needs to respect German landscape planning tools (Ibid)
- 3) Stresses that “[...] areas with soil especially suited for agricultural use are to be used only to the necessary extent [...]” for compensation measures (BNatSchG2009:§15 (3))

Landscape planning tools, which tend to be well developed in Germany, are often used in practice to identify a specific location and lot suitable for carrying out compensation measures.

6.3.3 The temporal dimension in implementing the compensation measure

Whereas the Building Code directly addresses the temporal disconnection between impact and compensation by stating that „*compensation measures can be carried out before an intervention takes place or an impact is attributed*” (personal translation, BauGB2004: §135a (2)), the Federal Nature Conservation Act only vaguely addresses the temporal dimension by stating that “*compensation and substitution measures shall be maintained throughout the relevant required period and shall be legally protected*” (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety 2009: 23). The eco-account regulation furthermore clarifies that the approval of an eco-account measure, and therefore its listing amongst the approved anticipated compensation measures in the compensation registry, expires if the measure is not implemented within five years after having been included in the compensation registry (ÖKVO 2011:§4 (2)).

6.4 The administration of the eco-account

As already mentioned in 6.1 the eco-account schemes are administered on a local level, i.e. the eco-account under the building law is managed by municipalities (on a municipal level) whereas the eco-account under nature conservation law is managed by the LNCAs. Whether or not these are the optimal levels for administering each one of the schemes has been debated and stakeholders interviewed expressed different views on this issue.

Municipalities appear very interested in playing an instrumental role in the implementation of the IMR, including the freedom to create an eco-account, to identify suitable lots, to use an own evaluation model to assess residual impacts and compensation measures, to cooperate with selected local partners and to use own anticipated compensation measures for off-setting within municipal boundaries. Interviewees confirmed that municipalities would resist any attempt to transfer their competences as regards the municipal eco-accounts to higher administrative levels (personal communication, University for Economics and Environment Nürtingen-Geislingen: Mr. Prof. Dr. Küpfer; municipality of Donaueschingen: Mr. Dr. Bronner). An interviewed mayor stated “*If the eco-account would be administrated on a higher level, it would be condemned to fail [...], decentralised structures and allocations of tasks [...] can be a key success factor*” (personal communication, municipality of Steinach/Baden: Mr. Edelmann).

While the municipal level seems well suited to implement the requirements of the eco-account under the building law, interviewed stakeholders recognised that some challenges might call for slightly

Württemberg for example is divided into 13 natural areas of 3rd order (which represent sub-categories of the habitat areas under 2nd order) (LUBW 2010: 1-3) (see maps ANNEX II).

adapting the scope of these eco-accounts. One of these challenges is the increasing scarcity of land, which leads to an increased difficulty in identifying lots to carry out compensation measures. This scarcity calls for giving consideration to applying the building law eco-accounts at the level of intercommunal cooperation²³. Although compared to the experiences in other federal states (Jordan 2000; Böhme/Bunzel 2002; Spang/Reiter 2005; Jessel/Schöps et al. 2006) the development of intercommunal cooperation remains limited in Baden-Württemberg, there is an increased number of examples of intercommunal or trans-districtal cooperation. The example of the regional association “Regionalverband Oberschwaben-Bodensee”, integrating 14 municipalities in the agglomeration between Ravensburg and Friedrichshafen, shows that this could potentially have implication for the municipal eco-account, as the regional association is planning a common compensation area pool and eco-account (personal communication, RVBO: Mr. Franke). This may increase possibilities for implementing more costly compensation measures that are often excluded due to the limited financial means one single municipality can make available. This could also potentially help establishing strategically developed ecological networks. According to an interviewed mayor, commenting on the constraints resulting from the limited availability of appropriate lots for compensation measures in certain municipalities “[...] *the future of the eco-account will be an intercommunal one [...]*” (personal communication, municipality of Ottersweier: Mr. Pfetzer).

As highlighted earlier, the spatial scope for the implementation of compensation measures in the context of the eco-account under nature conservation law is delimited by the natural regions, which can be defined as eco-regions with specific habitat and ecosystem types (see Annex II). The question has been raised whether it might be possible to compensate an impact beyond the borders of federal states. Theoretically, this might be possible, as the natural regions do not coincide with the administrative boundaries of federal states. However, in practice this has not yet happened. The main obstacles to compensation beyond the borders of federal states are the absence of a formal mapping of habitat areas in Germany as well as the absence of standardized evaluation models that would be valid for all federal states (thus making it challenging to ensure equivalence between credits attributed to the impacts and the compensation measures) (personal communication, Flächenagentur BW GmbH: Mr. Sedlak). The absence of standardised evaluation models also restricts the extent to which eco-accounts could be used in an integrated way beyond the borders of municipalities or districts (personal communication, Mr. Prof. Dr. Küpfer). The German Federal Government had been working on addressing this issue through a Federal Compensation Regulation but as of late 2014 work on it had been suspended.

6.5 Attributing points to compensation measures and residual impacts: the role of evaluation models

This section discusses how the evaluation models used in the framework of the IMR and eco-accounts are used to represent and assess the biodiversity and ecological value associated both with impacts from developments and eco-account measures. While there are theoretical discussions relating to the extent to which biodiversity can be objectively represented by quantitative metrics (Tucker et al. 2014), this is beyond the scope of this analysis.

6.5.1 Introduction: Co-existence of a variety of evaluation models

In Baden-Württemberg numerous evaluation models coexist. Neither the Building Code nor the nature conservation legislation obliges developers or compensation agents to use a specific evaluation model. This implies that under the building law eco-account, every municipality in Baden-Württemberg could potentially use its own evaluation model (a case example is provided in annex V).

²³ **Intercommunal** cooperation is mainly related to the establishment of **intercommunal compensation area pools*** which can be distinguished from **regional compensation area pools***.

In response to an increasing demand from municipalities for a legally secure and standardized evaluation model, the former LfU/LUBW requested in 2000 the “Institute for Botany and Studies of Landscape Karlsruhe”²⁴ to develop an evaluation model (LFU 2005, Vogel 2012: 19 et seq.; Breunig 2013). Since 2005, the use of this evaluation model is recommended on a regional level by the LUBW for the building law eco-account. A slightly modified version represents the official evaluation guideline for the eco-account under nature conservation law. According to estimates, 60% of municipalities in BW use the LUBW-recommended evaluation model, 20% use a slightly modified version of the recommended model and 20% use completely different evaluation models (personal communication, University for Economics and Environment Nürtingen-Geislingen: Mr. Prof. Dr. Küpfer). A full standardisation on a national level appears rather unlikely in the near future.

6.5.2 Analysis of the main evaluation model used under the nature conservation law (in B-W)

The evaluation model recommended by the LUBW for the evaluation of residual impacts and compensation measures within the eco-account under nature conservation law is a “habitat-hectare-model” (literally “biotope-value-procedure” or, in German, “Biotopwertverfahren”). The eco-account regulation states that the value of a compensation measure (in eco-points) is the difference between the nominal value and the actual value (ÖKVO 2011: §8; annex II). An exception to this are so-called “punctual compensation measures” (“punktuelle Maßnahmen”), which are defined as small-area compensation measures resulting in ecological improvements going far beyond their surface and yielding positive effects across an area which is difficult to determine strictly. The value of this type of compensation measures, which result in ecological benefits which are higher than their small surface taken for their implementation would suggest, is determined by applying the “development cost approach” (“Herstellungskostenansatz”). In this approach one Euro is assumed to be worth four eco-points (i.e. the development costs directly translate into eco-points - e.g. a compensation measure costing 10.000€ is worth 40.000 eco-points). (See case study example in section 7.2 for a practicable example of such as “punctual compensation measure”).

In general, the evaluation model assesses separately the different assets that are covered under the regulation, which are added up to define the total number of eco-points attributed to an impact or a compensation measure. The **evaluation of biotopes/habitats** is based on a 64-points-scale biotope-value-list (ÖKVO 2011: annex 2, table 1) where eco-points are attributed to all habitat types to be found in Baden-Württemberg (e.g. sealed surface = 0 points; healthy peatland = 64 points). The evaluation model provides two modules: (a) the “fine module” (“Feinmodul”) to assess the actual value of habitats and (b) the “planning module” (“Planungsmodul”) to forecast the nominal value of habitats. The entire list is made up of a standard value and span between extreme values allowing room for manoeuvre in case a habitat type is developed in a lower or higher quality than the standard value. The LNCAs validate chosen values through a “plausibility check”.

Compensation measures which aim to foster specific (animal and plant) species are attributed eco-points which are calculated both on the basis of the size of land on which habitat was created or restored or the size of the newly created populations. Conditions for the recognition of compensation measures that are meant to foster specific species include that the species targeted occurs within relatively close proximity, that a technical evaluation demonstrates that the measure is likely to be successful (i.e. demonstration of favourable locational conditions and required habitat and food resources) and that the measures creates new populations of the targeted species, etc. The number of eco-points is variable from one species to another and clearly defined in a table accompanying the Eco-account regulation (ÖKVO, 2011, annex 2, table 2). The attribution of eco-points occurs in two a measure targeting a specific species happens in two subsequent steps: 20% of the eco-points are

²⁴ “Institut für Botanik und Landschaftskunde Karlsruhe”

attributed once the compensation measure has been implemented, the remaining 80% of eco-points are attributed when the species has colonized the site.

The evaluation of soil is based on a global attribution of eco-points per m² depending on the soil's functions according to five evaluation categories (0= no fulfilment of the soil function, 4= soil fulfils all functions) (ÖKVO, 2011: annex 2, §3; table 3). If the fulfilment of a soil function can be improved by one evaluation category, four eco-points/m² are attributed.

An improvement of the groundwater quality can be credited with one to three eco-points/m² depending on specific evaluation categories called "hydrogeological units" (Breunig 2012: 13-18).

Box 6.1: Case example illustrating the attribution of eco-points under the LUBW evaluation model

In March 2012, the foundation "Stiftung Naturschutz" carried out the compensation measure "Haberslöh" (within the municipality "Willstätt/Sand", district "Ortenaukreis"), representing a "classical" compensation measure where former agricultural land is transformed into a specific type of wet meadow. The compensation measure has positive effects in terms of enhancing four different types of "goods": habitat type, soil and water quality as well as protected species. Eco-points were attributed to the compensation four different impact areas ("Wirkungsbereiche") and these were then added up to come up with the overall value attributed to the compensation measure.

In the habitat impact area the value of the compensation measure was evaluated by comparing the ecological value of the land prior to the implementation of the measure with its value after implementation. **Prior to the implementation of the compensation measure** the habitat value was given a score of four per m². Given an area of **9.230 m²**, following the habitat-hectare-model, the habitat value was multiplied by the area ($4 \times 9.230 \text{ m}^2 = 36.920$ eco-points) to come up with the original habitat value of the land in eco-points. The compensation measure implied the transformation of the land into a wet meadow with a habitat value of 32 ($32 \times 9.230 \text{ m}^2 = 295.360$ eco-points). The difference between both values ($295,360$ eco-points - $36,920$ eco-points = **258,440 eco-points**) represents the habitats enhancement value in eco-points of the compensation measure in the habitat category ("Wirkungsbereich biotope").

In the **soil category**, the compensation measure was also considered to have improved the **soil quality** by increasing the water absorptive capacity. Therefore, 3 eco-points/m² were attributed to the entire surface (3 eco-points \times $9.230 \text{ m}^2 = 27.690$ eco-points).

Third, for the planned improvement of the **groundwater quality** 2 eco-points/m² were attributed to the entire area (2 eco-points \times $9.230 \text{ m}^2 = 18.460$ eco-points).

In the 'specific species' category points are attributed to the creation of a new population of specific animal and plant species. The measure was expected to create habitats for the populations of the following six protected species: Natterjack Toad (*Epidalea calamita*), Common Snipe (*Gallinago gallinago*), Dusky Large Blue (*Maculinea nausithous*), Scarce Large Blue (*Maculinea teleius*), Yellow-Winged Darter (*Sympetrum flaveolum*) and Northern Lapwing (*Vanellus vanellus*). Altogether the value in eco-points attributed to these six species was **228,200 eco-points**. It must be noted that this does not represent the full number of points which can be attributed to these six species: they correspond to the initial 20% of the overall amount of points achievable which are attributed after the creation of a habitat favourable to the establishment a new population of each one of these species. The remaining 80% of points per species are only attributed to the compensation measure a population has settled in the area targeted by the compensation measure (see section 6.5.2).

The eco-points attributed to impact areas were added up as follows:

258.440 (habitat after nominal-actual value difference)
+ 27.690 (soil)
+ 18.460 (groundwater quality)
+ 228.200 (protected species)
= 532.790 eco-points²⁵

²⁵ Deviance of final results is related to using only results without decimal places.

Thus, overall, the compensation measure “Haberslöh” represented an ecological improvement value of 532.790 eco-points. As interests accrue (in the form of eco-points) ²⁶ every year once the compensation measure has been carried out the above described compensation measure had a real value of 572,740 eco-points (as of October 2014). In April 2013, an impact of 535.445 eco-points was attributed to this compensation measure (LUBW 2013c).

6.5.3 Uncertainties/ challenges of this evaluation model

The eco-account regulation provides a very detailed evaluation model that attributes eco-points to a limited number of assets (“Schutzgüter”) like habitat/ species, water and soil. To cover the evaluation of other assets like landscape appearance and to ensure the evaluation of the quality of the compensation, the deliberative approach* is recommended by the LUBW as an additional evaluation tool. Historically, a deliberative approach was created to overcome the limitations of purely mathematical evaluation models used in the 1980/1990s, such as the “ecological risk analysis” (Knospe, 1995). The deliberative approach consists of a standardised form that has been developed to ensure a consistent approach in describing and evaluating verbally the quality of compensation measures. According to the 2005 evaluation guidelines from the LUBW, a purely quantitative evaluation of compensation/residual impacts is not allowed (LfU 2005: 6).

The coexistence of numerous different evaluation models and the fact that the main guideline recommended by the LUBW refers to two slightly different models (both one for eco-accounts under building law and one to be used in the context of the nature conservation law) is an obstacle to the conversion of eco-points across different models. This for example implies that at present the building of a gas pipeline running through different municipalities and federal states would require the developer to use a wide range of different evaluation models (personal communication GASCADE: Mr. Höhlschen). This also means that for an eco-account under the building law to be converted into an eco-account under nature conservation law in Baden-Württemberg, a re-evaluation of its evaluation model is necessary. In the absence of the introduction of a ‘Federal compensation regulation’ (“Bundeskompensationsverordnung”) it is likely that the LUBW will be working towards a further harmonisation of the models used across Baden-Württemberg.

6.5.4 Actors involved in the evaluation of residual impacts/ compensation measures

The LNCAs are responsible for deciding how many compensation credits (eco-points) are attributed to an anticipated compensation measure and how many eco-points developers need to buy to offset the residual impacts from their development. In practice, compensation agents might often use the services of a private compensation agent such as compensation agencies* (“Flächenagentur”) or planning offices (“Planungsbüro”) which will help them provide the information requested by the LNCAs (e.g. plan, evaluate, implement the compensation measure and determine how many eco-points could be attributed to their compensation measure). The eco-account regulation explicitly foresees that the LNCAs may recognise private compensation agencies as “approved bodies” which may plan, implement and manage the compensation/eco-account measures on behalf of a compensation agent (ÖKVO 2011: §11). The LNCA may or may not agree with the eco-points suggested in the proposal and may request that these be lowered or increased to better reflect the value of the adverse residual impacts of a development or an anticipated compensation measure. See Annex IV – Institutional landscape – an overview: actors and their role in the governance of the eco-account schemes for a more comprehensive overview.

²⁶ The interest payment is calculated on a pro-rata base 3% per year.

6.6 Trading of eco-points and financing of eco-account measures

This section provides insights into the two interrelated subjects of the financing of compensation measures and the trading of eco-points. In this context, it seems to be worth mentioning that the entire pricing and trading procedure is based on compensation credits, a tradable unit of currency, called eco-points (see box below).

Box 6.2: Compensation credits: Eco-points as tradable units of currency in the centre of the eco-account scheme

The unit of currency of the entire evaluation and trading procedure for the eco-account under nature conservation law are the eco-points. Using such a credit system allows for comparisons between the loss in value of ecosystem services and biodiversity due to a residual impact and the added value in ecosystem services and biodiversity from a compensation measure. The eco-points facilitate the verification and enforcement of certain principles governing the use of the eco-account, such as the rule according to which residual impacts from developments need to be compensated at least like-for-like or the rule according to which impacts need to be compensated within the same impact category (i.e. residual impacts on a specific ecosystem service or good need to be offset through measure that recreate the same ecosystem service or good). Eco-points are tradable; therefore their monetary value is not fixed. The value results from a negotiation between the compensation agent and the developer (Böhm/Kaiser 2012: 10). Although representing biodiversity value in a techno-mathematical and/or monetary unit of currency has been challenged from a theoretical perspective, some practitioners on the ground claim that the use of eco-points increases the operability, comparability, transparency and standardization of the eco-account tool (personal communication, Flächenagentur BW GmbH: Mr. Sedlak, district office of Offenburg: Mr. Müller).

6.6.1 The principle of tradability and the pricing of compensation measures with the eco-account under nature conservation law

Conditions of trading eco-points/ compensation measures

The eco-account regulation creates a legal framework that serves as a basis for the trade of eco-points (and thus, compensation measures) in the context of the eco-account under nature conservation law. It specifies that the transfer or sale of compensation measures or eco-points is legally allowed, but needs to be notified to the LNCA, which is responsible for modifying the entries in the eco-account registry. In case of trading the land on which a compensation measure was implemented together with its attributed eco-points all rights and obligations, especially those relating to safeguarding and maintenance, are transferred to the new owner (personal translation, ÖKVO 2011: §10). Should only the eco-points be bought, the implementation and maintenance of the compensation measure is still to be assured by the owner of the land on which the compensation measure was implemented. Whatever the scenario, in line with the polluter-pays-principle, the developer needs to fully assume responsibility for the compensation of his/her impacts and if necessary has to comply with his obligations (under the IMR) through additional contracts, beyond those resulting from the use of the eco-account. In practice, developers usually decide to purchase eco-points when they are not in a position to implement the necessary compensation measure(s) (Fehrenbach 2012: 36).

The main actors involved in trading are developers and/or compensation agents. In the majority of cases, trading actions are facilitated by private compensation agents like planning offices or compensation agencies offering their specialised services. Any trading actions need to be notified to the LNCA.

Pricing of compensation measures

In Baden-Württemberg it is not possible to know the price of a compensation measure through consulting the (publicly available part of the) compensation registry, in which the value of a

compensation measure is only expressed in eco-points. The price seems to be primarily defined through negotiation between the compensation agent and the developer and may therefore be considered at present rather independent from supply and demand given the relatively limited number of compensation measures that developers can choose from within the same habitat type in the eco-account registry. While it cannot be excluded that in the long run the price of eco-account measures may be more influenced by the availability of compensation measures within a given habitat type (“Naturraum”), in these early stages of implementation of the scheme this does not seem to be the case. Current practice means that the price is ultimately determined in a private-law procedure between the compensation agent, the owner of the land (if he is not the compensation agent) and the developer (Fehrenbach 2012:37). In this context, competition through multiple alternatives available as regards the compensation measures to choose from might have an impact on the price in the long run, as developers have an interest in meeting their obligations at the lowest possible cost. Compensation agents, on the other hand, have an interest in selling their measure at a price that covers at least the acquisition costs of the land, the cost of the anticipated compensation measure and the maintenance costs until the measure has been attributed to an impact (personal communication, municipality of Villingen-Schwenningen: Mrs. Siegel; Flächenagentur BW GmbH: Mr. Sedlak). To ensure that the negotiation of the price does indeed take into account the latest value of a compensation measure the developer and/or the compensation agent can request a re-evaluation of the anticipated compensation measure if much time has elapsed since the compensation measure entered the compensation registry. As already mentioned in 6.5.2, in the exceptional case of “punctual compensation measures”, the price is defined according to the rule that four eco-points correspond to one Euro.

6.6.2 Financing of compensation measures

To receive the payment to cover the costs of the compensation measure, compensation agents have to sell their eco-points to a developer. In case the compensation agent and the developer are the same entity/person, no financial transaction is necessary, as long as the eco-points attributed to the restoration measure are sufficient to offset the residual impacts (e.g. see section 7.3). As in most cases, however, the developer and the compensation agent are two separate entities, a transaction takes place. In these cases, time has often elapsed between the moment a compensation measure was registered and the moment it gets attributed to an impact. In particular in the context of the eco-account under nature conservation law, this means that the compensation agent would have to ensure the initial financing of the compensation measure and carry all possible risks associated with this. This “time gap” often means that in practice the implementation of planned measures (that have been included in the compensation registry) only starts once the eco-account measure has been attributed to an impact and the compensation agent has received a payment that covers at least some of the costs associated with implementing the compensation measure.

Where this is not the case, compensation agents usually pre-finance the planning and sometimes the realisation of their anticipated compensation measures themselves. To minimize the risks associated with the aforementioned “time gap”, compensation agencies, not only offer to sell eco-points to developers, but also act as intermediaries between developers and compensation agents in order to help the latter finance the realisation of a compensation measure through the developer. Ideally, the temporal flexibility would lead developers to integrate their needs of compensation into their development plans at an early stage to ensure a certain planning reliability, e.g. five years before carrying out a development (personal communication, Flächenagentur BW GmbH: Mr. Sedlak).

To encourage private investment in compensation measures and incentivise the anticipated implementation of these measures the eco-account under nature conservation law foresees an interest payment of 3% a year on registered compensation measures that have been implemented.

This means that the number of points originally attributed to a compensation measure increases by 3% a year starting from the moment the registered compensation measure has been implemented and until its eco-points are actually attributed to a residual impact (and this during a period lasting up to ten years) (ÖKVO 2011: §5)²⁷. It is worth stressing that the “the 3 percent interest payments” take the form of 3 percent increase in the eco-points originally attributed to a compensation measure and are not equivalent to cash payments.

For the eco-account under the building law, municipalities use funds from the municipalities’ budget to finance anticipated compensation measures. Depending on projects, municipalities may decide to subsidise small private investors that are not in a position to pay entirely for the compensation of their residual impact (personal communication, University for Economics and Environment Nürtingen-Geislingen: Mr. Prof. Dr. Küpfer, FVA BW: Mr. Dr. Waldenspuhl).

6.6.3 Who owns the land where compensation measures are carried out on?

In general, compensation measures can be carried out on land with all kinds of status of property including private and public (communal, regional and national) property.

The eco-accounts measures under the building law are mainly implemented on communal/ publicly owned land, whereas compensation measures under the eco-account under nature conservation law have so far mostly been carried out on private land (belonging to private foundations, companies). In addition compensation measures have also been found to be carried out on land owned by other actors such as land owners (e.g. farmers), forest owners and both regional and federal public institutions (e.g. regional Ministry for Finance and Economy Baden-Württemberg in charge of administering the public property of Baden-Württemberg (ca. 36,1 km²) (Ministerium für Finanzen und Wirtschaft BW 2013), the Real Estate Services Ltd. from the regional Bank of Baden-Württemberg²⁸ and the national Institute for Federal Real Estate²⁹ (personal communication, Flächenagentur BW GmbH: Mr. Sedlak).

In certain municipalities, contracts under this kind of eco-accounts are also established between the municipality and private landowners (“Grunddienstbarkeitsregelung”), who give the municipality the possibility to lease the land for the implementation of compensation measures (personal communication, municipality of Steinach/Baden: Mr. Edelmann).

For a compensation measure to be approved and enter in the compensation registry of the eco-account under nature conservation law the compensation agent needs to provide the LNCA with an acknowledgment of the availability of the land and a certificate from the municipality that states that it is not foreseen that the lot be integrated in a future development project (ÖKVO 2011: §3 (2.4 and 2.9)). Indirectly, this implies that compensation measures can only be carried out on land on which the future compensation measure is safeguarded in the long run and secured either through land buying, leasing (“Pacht”) and/or entry in the land change registry (“dingliche Sicherung”).

²⁷ Limiting the interest payment in amount and time aims at combining an incentive function with avoidance of the possibility to create an enormous added value with the time allowing the attribution of an initially small compensation to a future huge impact (e.g. in case of an temporally unlimited interest payment of e.g. 10% a compensation measure of one hectare with an initial value of 100.000 eco-points could then potentially be used in 30 years to compensate for an impact of 400.000 eco-points (10% out of 100.000 EP= 10.000EP x30 years = 300.000, 100.000 EP + 300.000 EP= 400.000 EP)) (personal communication, Flächenagentur BW GmbH: Mr. Sedlak).

²⁸ “LBBW Immobilien Landsiedlung GmbH”

²⁹ “Bundesanstalt für Immobilienaufgaben”

6.6.4 By whom and how is the responsibility for the maintenance of compensation measures ensured?

While the German IMR and the eco-account scheme regulation outline in detail aspects relating to the period before the implementation of a compensation measure until after it is fully implemented, they only deal with questions relating to the long-term control and monitoring to a limited extent. Actors involved in the monitoring procedure are the lower nature conservation authorities, municipalities, nature conservation representatives (“Naturschutzbeauftragte/r”³⁰), planning offices, compensation agents and the developer.

The Federal Nature Conservation Act 2009 sets up the basic legal framework stating that off-setting is to be maintained and legally protected throughout the *relevant required period* which needs to be determined by the competent authority and the developer, or his legal successor, who is responsible for implementing, maintaining and securing compensation measures (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety 2009: 23). This means that a compensation measure should be designed and safeguarded to remain functioning as long as the impact persists and the development exists. To ensure that such a long-term maintenance obligation is fulfilled even if compensation measures are carried out on private land, contracts can be established to transfer the right to use the land to public authorities (“Grunddienstbarkeitsregelung”). A court decision from the Higher Administrative Court Lüneburg in 2000 indicated that a timely limitation (“Befristung”) of a compensation measure in an urban development plan is not allowed (OVG Lüneburg, 14.09.2000 (1K 5414/98) quoted after Spang/Reiter, 2005:94- 95). This is meant to avoid that the same compensation measure is used several times to compensate for different impacts.

The Building Code is more specific in defining the responsibility of municipalities in ensuring the long-term maintenance of the compensation measures in the context of the **building law eco-accounts**. The municipalities are in charge of controlling considerable effects on the environment from the implementation of urban land-use plans to determine unexpected negative effects and implement appropriate, corrective measures (personal translation, Building Code: §4c). In practice, while there are different approaches, planning offices are often charged by municipalities with the monitoring of the compensation measures implemented under the building law eco-account. During the construction procedure (“Bebauungsverfahren”), public-law contracts are established between the municipality, the LNCA and the compensation agent (if it is not the municipality) to regulate further monitoring and control of compensation measures, i.e. once implemented, compensation measures are to be regularly checked by the compensation agent (e.g. after 2, 3, 5 and 10 years) (personal communication, municipality of Ottersweier: Mr. Pfetzer). If planned objectives have not been achieved, readjustments (like reapplication of sowing, re-cutting of hedges, replanting of certain plant species etc.) can be requested. Maintenance costs incurred should be included up-front in the overall estimation of costs (expressed in eco-points) necessary to carry out a compensation measure. While there is no obligation to report to the LNCAs (personal communication, district office of Offenburg: Mr. Müller), reports about control and monitoring, which cannot be consulted by third parties, may be produced for the LNCAs (personal communication, University for Economics and Environment Nürtingen-Geislingen: Mr. Prof. Dr. Küpfer). Whereas certain LNCAs do not perform the controlling function at all, others conduct random samplings or entrust municipalities with the responsibility to do so³¹. In case requirements are not respected, sanctions are possible at the level of

³⁰ In Baden-Württemberg, nature conservation representatives (“Naturschutzbeauftragte”) are appointed by the county council (“Kreistag”) with recommendation from the chief administrative officer of a district (“Landrat”) for five years. Often they fill this honorary post for several mandates, in average 13 years. Since the latest administrative reform, they have been integrated into the lower nature conservation authority (Kuon 2007: 92).

³¹ A development plan can be considered as a legal norm on a low administrative level for which the legislative authority, in this case the municipality, is responsible. In case that foreseen compensation measures are not carried out the

the LNCAs and through the public supervision of local authorities (“Kommunalaufsicht³²”). However, administrative interdependence and a lack of human resources, especially within LNCAs, means that sanctions are rarely applied. This may be considered one of the major weaknesses of the eco-account scheme in Baden-Württemberg as implemented today (personal communication, FVA BW: Mr. Dr. Waldenspuhl, municipality of Villingen-Schwenningen: Mr. Schott, district office of Offenburg: Mr. Müller).

With regard to the **eco-account under nature conservation law**, it is worth mentioning that the eco-account regulation does not explicitly refer to monitoring or control. As this type of eco-account has been set up only in 2011, there are no experiences with long-term monitoring and control and final conclusions cannot be drawn but it is not unlikely that limitations encountered, such as the limited resources for long-term monitoring within LNCAs, will be the same.

Besides the analysed legislation regulating the eco-account, monitoring is also regulated in the context of the environmental impact assessment and the related environmental reports.

municipality should interfere and sanction the non-respect of the legal norm. If the municipality misses to perform its controlling function, the public supervision body of municipalities (“Kommunalaufsicht”, see above) should enforce the implementation of compensation measures. In practice, this controlling mechanism is not used (personal communication, district office of Offenburg: Mr. Müller).

³² Mayors represent the head of a municipality and are inter alia chairman of the municipal council (“Gemeinderat”). All mayors of one district constitute the county council (“Kreistag”) which elects the chief administrative officer of a district („Landrat“). The “Landrat” is not only a person, but also representing the lowest administrative authority in Germany. The entire action of a municipality is supervised by the federal state. The supervision is divided into control of legality and supervisory control. In general, the district office (“Landratsamt”) is in charge of supervising municipalities within its district. But due to a mutual controlling function between the district office and the county council, potential possibilities of sanctions are used very rarely.

7 COMPENSATION USING ECO-ACCOUNTS IN PRACTICE

7.1 Illustrative case examples

In order to illustrate how the eco-account works in practice, this section presents three examples of instances in which it has been used to meet offset requirements. The two first examples illustrate the use of eco-accounts established under the building law and the two latter examples the compensation of residual impacts through compensation measures registered in the eco-account established under the nature legislation.

7.1.1 Example of an eco-account under the building law (1): An eco-account drawing on broader public participation - Steinach, district "Ortenaukreis"

In 2005/2006 the municipality of Steinach, situated in the Baden region of the Black Forest, requested a trained landscape planner to analyse potential options and locations with high potential ecological improvement to carry out anticipated compensation measures to offset the residual impacts of future developments. As agreed with the municipal council, an "overall concept" was established³³ and integrated into the municipality's landscape planning tools. An overgrown mountain slope called "Steinacher Hausberg Kreuzbühl-Altenberg" (Baden-Online 2013) was turned into an open landscape used partially as extensive grassland (as this involved the clearing a forest of relatively low ecological value, this was considered an upgrading in the ecological value of the land). The major development requiring compensation has so far been an intercommunal industrial area ("interkommunales Gewerbegebiet"- "Gewerbegebiet Interkom Steinach/Raumschaft Haslach")³⁴ of 10 ha within the municipal boundaries of Steinach. In 2007, the development started and first firms settled. In 2011, 2.1 ha were sold to eight firms and in 2012, 1.1 ha were acquired by four firms (Baden-online 2012). Temporal flexibility exists to some extent in the way the compensation measures have been carried out in Steinach as, once the projected residual impacts from a development have been attributed to a compensation measure, it got implemented in an area which had previously been identified in the compensation area pool.



The "Hausberg Kreuzbühl-Altenberg" in 2005 when the entire mountain slope was covered by high forest, mainly spruce, obstructing the view.
Source: Stöhr, 2006b, p.12

A wide range of local stakeholders including schools, NGOs ("Agendagruppe", experts from NABU etc.), municipal maintenance department ("Bauhof"), nature conservation representatives and landscaper planners were involved both in the planning and the implementation of the anticipated compensation measures (Stöhr, 2006a; Stöhr, 2006b; personal communication, municipality of Steinach/Baden: Mrs. Stöhr and Mr. Edelmann, further information are available in German on the municipal webpage: www.steinach.de).

³³ The overall concept is based on previous works developed by different planning offices since December 2004

³⁴ Via a cooperation of several municipalities, in this case Steinach, Haslach, Fischerbach Hofstetten and Mühlenbach, planning, implementation and using of an industrial area are shared by different municipalities. It can be considered as sustainability strategy on a local level pushing regional development further via cooperation on an economic, political and administrative level. The five aforementioned municipalities founded an administration union called "Zweckverband Gewerbegebiet Interkom Steinach / Raumschaft Haslach" on 31st October 2003(Baden-Online 2012).

The mountain slope was cleared in order to be free again as in 1911 and enable the view over the valley. (Source: Baden-online 2013)



Lots on the mountain slope, now managed as extensive grasslands, are used as compensation measures (Source: JS, field trip, Steinach, 18/04/2013).



The intercommunal industrial area in Steinach on the potential scale of 10ha. View from the Hausberg (Source, JS, field trip, Steinach, 18/04/2013).

7.1.2 Example of an eco-account under the building law (2): Dettingen unter Teck, Esslingen district

In 2002, the municipality of Dettingen unter Teck developed a land development plan (“Bebauungsplan”) to regulate the development potential of certain lots, including a future housing development area located in the municipality (Dettingen unter Teck 2012). Given the need to offset residual impacts associated with building houses on a greenfield site, the land development plan foresaw compensation measures both within the housing development area and, for those impacts which could not be compensated within it. After the realisation of the compensation measures within the housing development area (in particular greening measures such as roadside trees, planting of hedges and trees at the edges of the village as well as permeable soil covers in parking lots), a compensation deficit of 60,000 eco-points remained.

In this context, the planning office “StandLandFluss”, in charge of the municipal eco-account since 2000/2001, developed a proposal for an anticipated compensation measure which aimed at the

restoration of the municipal river “Lauter” (“Restoration of the continuity of the Lauter through the alteration of a dam”). The measure was meant to support the implementation of a broader strategy aiming to ensure the continuity of the Lauter river (“Gewässerentwicklungsplan”). In the 1950s, the river was straightened and consolidated to make more land available for construction works in the municipal urban development plan. In 2008, the compensation measure was implemented and, on a specific part of the stream, weirs were replaced with a near-natural river bottom profile (creating rapids and pools) and riparian vegetation was planted to improve landscape appearance. The cost of the restoration measure was about €15,000. As this compensation measure was considered a so-called “punctual compensation measure” (i.e. carried out on a small surface but resulting in high ecological benefits), four eco-points were attributed to each euro spent in the project. Therefore, the measure was considered to have compensated all residual impacts from the development (equivalent to 60,000 eco-points) (personal communication, StadtLandFluss: Mr. Prof.Dr. Küpfer).



Weir built in the 1950s and representing an obstacle to fish migration in the river „Lauter”. Initial state before the implementation of the compensation measure in 2008. (Source: StadtLandFluss, internal documents).



Today, after the implementation of a river bottom ramp, the natural migration of fish is ensured. (Source: JS, field trip, 15/05/2013)

§135a BauGB (Federal Building Code) regulates stipulates that the costs for compensatory measures are to be paid by the developer and/or the owner of the building/house to be build on a given plot

(although the municipality may decide to top up in order to implement a larger compensation measure than what would be strictly required to offset residual impacts). In this case, the about 50 home owners were required to pay not only the price for purchasing their lot but also contribute proportionately to the costs associated with the implementation of the compensation measures offsetting the residual impacts. The proportional distribution of the costs means that the contribution of each home owner was linked to the size of the lot purchased in the development. About 90% of the overall costs of residual impact compensation were paid for by the home owners, 10% by the municipality (for public roads etc.). The overall cost of the compensation of residual impacts was €50,000, suggesting that the individual home owner had to pay an average of about €900 (the exact figure depending on the size of the lot on which they built their house).

7.1.3 Example of an eco-account under nature conservation legislation (1): Uses of the eco-account scheme by the pit and quarry industry

In 2007/2008, Holcim Süddeutschland GmbH, a German branch of the global cement supplier Holcim Ltd.(which has an aggregates extraction site on the frontier between the municipalities of Dotternhausen and Dormettingen), decided to participate in the Baden-Württemberg pilot project for the eco-account under nature conservation legislation. The first anticipated compensation measure was carried out by this private compensation agent to offset residual impacts arising from the mining activities in the same municipalities. Land that the firm owns and where extraction took place from 1939 to the 1980s was identified as land with a high potential for ecological improvement. Particularly intrusive extraction techniques used at the time prevented a restoration of the land to its original (pre-exploitation) state.



Stockman with a traditional breed of donkey on the restored land. (Source: Holcim Süddeutschland GmbH, Environmental Report 2011, p. 9).

In 2010/2011, Holcim Süddeutschland GmbH and its partner planning offices started carrying out the anticipated compensation measures on an area of about 5 ha with the objective of establishing a half-open neglected grassland with a rather complex extensive grazing scheme relying on traditional breeds of goat, sheep and donkey to push back rampant wood and plants. While the impact has not yet been attributed, Holcim Süddeutschland GmbH intends to use the compensation measure to offset the residual impacts from a future extension of their production site. 344.612 eco-points were originally attributed to this anticipated compensation measures (personal communication: Holcim Süddeutschland GmbH: Mr. Kauper, Flächenagentur BW GmbH/ ISTE BW e.V.: Mr. Sedlak, University for Economics and Environment Nürtingen-Geislingen: Mr. Dr. Röhl) (Further information see Holcim Süddeutschland 2011 and LUBW 2013d).

7.1.4 Example of an eco-account under nature conservation law (2): Uses of the eco-account by a private foundation

The majority of anticipated compensation measures registered in the eco-account registry in Baden-Württemberg were developed in the district "Ortenaukreis". These are mainly to be implemented by the same compensation agent, a registered private foundation ("Stiftung Naturschutz"). The strategy of this foundation involves buying land with high ecological improvement potential from other private actors, mainly farmers, to carry out anticipated compensation measures under the eco-account under nature conservation legislation (in order to trade the eco-points that will be attributed to them).

An example that can serve as an illustration of the anticipated compensation measures carried out is the transformation from cultivated land into extensive grassland ("Wiesenknopfsilgenwiese") on a lot of 11.518 m² in Rheinbischofsheim, an administrative entity of the city of Rheinau (district "Ortenaukreis"). To re-create a natural grassland layers of hay and flowers that are cut on local species rich grasslands were applied to the bare soil (following a method called "Mähgutübertragung", i.e. "transmission of swaths").

This compensation measure, aiming at improving several assets simultaneously (soil, water, biotope and specific species), was attributed 416 246 eco-points and was used to compensate impacts in the municipality of Ottersweier (Raststatt district) in the scale of 396 758 eco-points. Ottersweier which took already part in the pilot project in 2008, developed a land development plan in 2012 identifying an area of about one hectare to set up the house development project "Lindenbuckel-Falkenreben". Whereas certain impacts from the development, especially species- and biotope-related impacts, were offset directly in the municipality itself (e.g. hanging of 63 nest boxes for birds and bats, development of 21 cavernous trees), the price of land within the municipality on which restoration of the soil function could have taken place was too expensive. Therefore, buying an anticipated compensation measure from the "Stiftung Naturschutz" was a more cost-effective way to compensate for the residual impacts within this impact category.

Specific noteworthy elements of this case example include the following two points. Firstly, in the trading of eco-points across districts' and administrative regions' borders: the identification of a cost-effective compensation measure was considered easier by crossing borders instead of searching within the same administrative district. Secondly, a municipality was the "client", i.e. the developer, using the eco-account under nature conservation legislation to compensate for its residual impacts (personal communication, Bhm GmbH: M. Bresch, municipality of Ottersweier: Mr. Pfetzer and Mr. Frietsch) (For further information see Ottersweier 2012 and LUBW 2013e).



Map of the area on which the house development „Lindenbuckel-Falkenreben“ has been carried out (before development), on a scale of 1:2500 (Source: Bebauungsplan „Lindenbuckel-Falkenreben.Gemeinde Ottersweier, Planungsbüro Schippales. 01.06.2012 In: <http://www.ottersweier.de/data/aktuellesAusDemRathaus.php?id=276692> [accessed on 05/07/2013].)



View today on the compensation measure implemented since March 2012 (Source: JS, field trip, 16/05/2013)

7.2 Diffusion and use of the two types of eco-accounts in Baden-Württemberg – quantitative insights

Providing figures on the eco-account under the building law is difficult due to the lack of data in Baden-Württemberg – data could only be found at the municipal level. In the context of this research project, 47 local entities were contacted in Baden-Württemberg, including all 41 entities on a district level plus six municipalities. 19 answered to the survey (40% of the contacted one).

The main results are shown in Figure 7.1, 7.2 and 7.3.

Figure 7.1 shows the type of eco-accounts used by local entities in Baden-Württemberg. Local entities use mainly the eco-account under the building law, as it was established before the eco-account under nature conservation legislation and it covers the main residual impacts occurring on a municipal level. 32%³⁵ of the local entities that have answered to the survey have introduced the eco-account under nature conservation legislation since 2011. Unfortunately, it was difficult to come to a robust conclusion as to how many municipalities do not use the eco-account scheme at all – stakeholder interviews suggest that this number might be somewhere around 30% (personal communication, University of Economics and Environment Nürtingen-Geislingen: Mr. Prof. Dr. Küpfer).

³⁵ The following check value confirms this figure resulting from the survey: According to the eco-account registry 13 out of 41 local entities use the eco-account under nature conservation legislation which refers to 31, 71%.

Figure 7.1: Type(s) of eco-accounts used by local entities in Baden-Württemberg

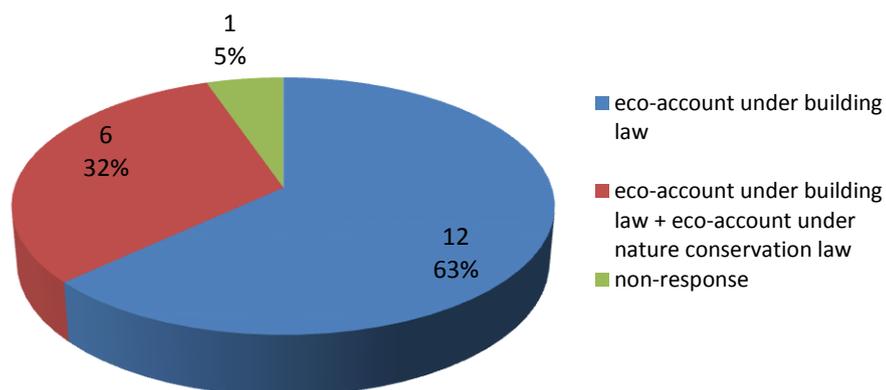
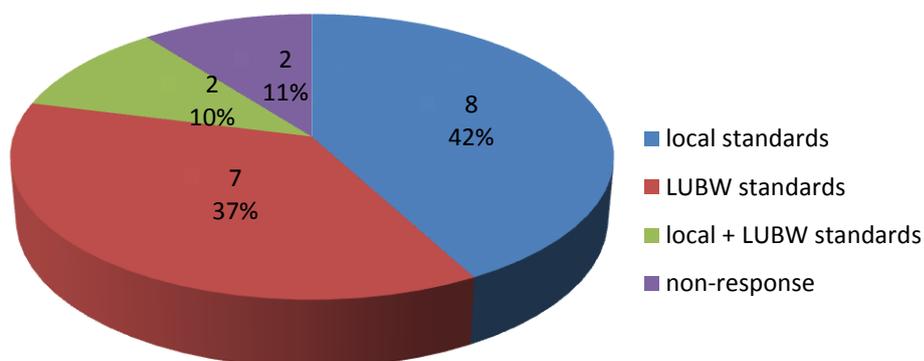


Figure 7.2 shows the types of evaluation standards used for the eco-account under the building law. The majority of local entities (42%) use local evaluation standards to estimate the value of compensation measures and residual impacts. But if we combine the percentages of municipalities that refer exclusively to the regionally standardized LUBW-model and the one referring to the LUBW-standards when evaluating measures/impacts for the eco-account under the nature conservation law, the majority of municipalities (37%+10%=47%) has adopted the regionally acknowledged one.³⁶

Figure 7.2: Types of evaluation standards used for the eco-account under the building law in Baden-Württemberg



Regarding the eco-account under nature conservation law, the establishment of quantitative analysis is facilitated via the insights gained from the central compensation/eco-account registry. By 2nd July 2013, 56 anticipated compensation measures had been registered in the eco-account registry. For 25

³⁶ The following example from the district of the “Alb-Donau-Kreis” illustrates the complexity of the situation: The district encompasses 55 municipalities using the eco-account under the building law. 14 municipalities under the administrative entity “Verwaltungsverband Langenau” use the evaluation model from the federal state Bavaria, the municipality of Allmendingen as well as four out of 13 municipalities from the administrative collectivity Munderkingen use the LUBW-model. Several other municipalities use older evaluation models from the federal states Hesse and Rhineland-Palatinate (personal communication, Mr. Hohneker).

measures, i.e. 45% out of the registered compensation measures, the implementation phase had started or was finalised. This implies that the majority of compensation agents use the temporal flexibility of the eco-account to minimise the time gap between implementation and potential payment of a compensation measures. In other words, they prefer registering an anticipated compensation measure in the eco-account, but wait for the implementation until a residual impact is attributed³⁷.

Figure 7.3 illustrates the number of anticipated compensation measures by local entities registered in the eco-account registry of Baden-Württemberg since 2011. To avoid bias, only the implemented anticipated compensation measures are considered, whereas the planned ones are excluded as they can potentially still be deleted from the registry. The 25 implemented anticipated compensation measures correspond to an overall value of 5,647,641 eco-points and an overall area of 214,533 m².

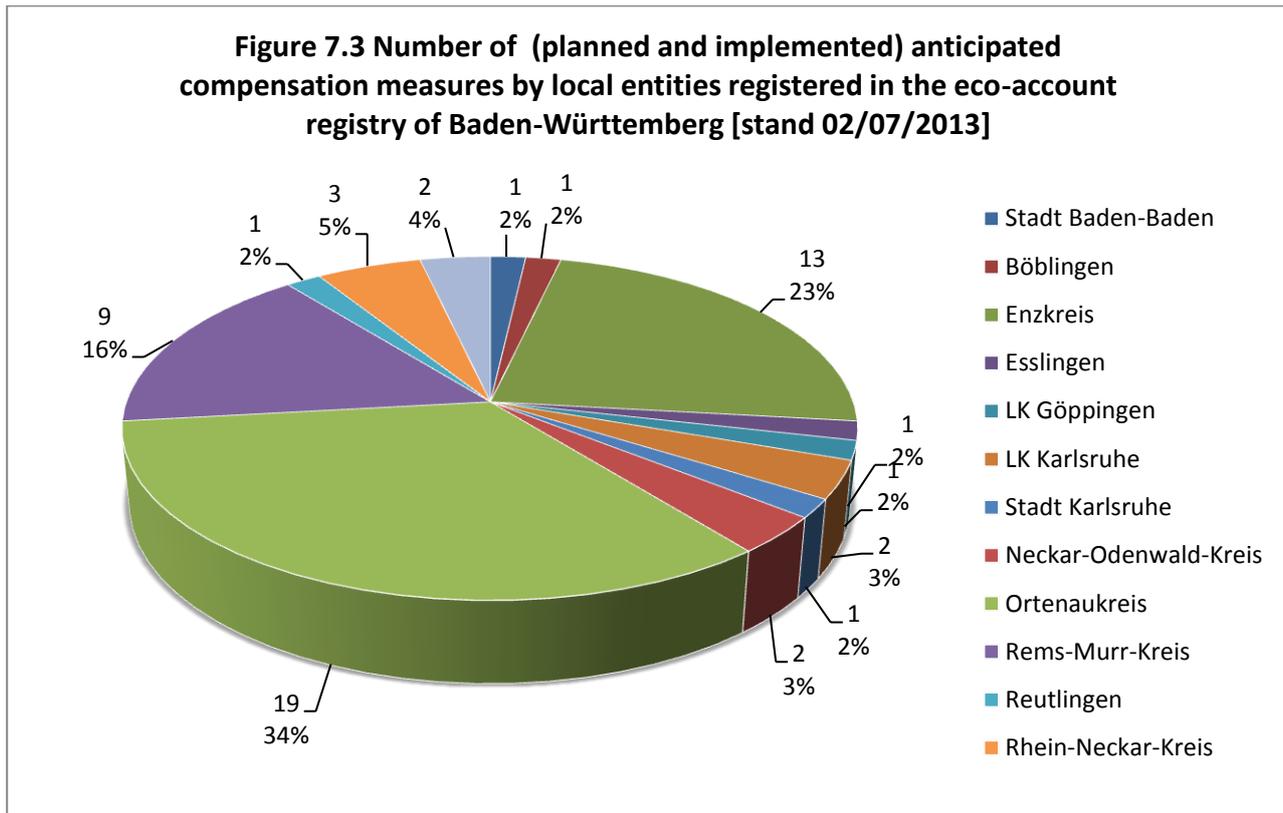


Figure 7.3 also illustrates that some local pioneers are pushing the implementation of the eco-account under nature conservation legislation forward: The district “Ortenaukreis” represents 34% of the entire anticipated compensation measures in Baden-Württemberg due to the activities of the foundation “Stiftung Naturschutz”. The district “Enzkreis” represents 23% and the “Rems-Murr-Kreis” 16% of registered anticipated compensation measures. In absence of forward-pushing pioneers, municipalities often register one or two anticipated compensation measures to safeguard them for a future attribution to residual impacts. By early July 2013, 15 impacts had been registered to the eco-account registry, representing an overall value of 1,887,882 eco-points³⁸, 13 of which had already been attributed to compensation measures.

In general, since the adoption of the eco-account regulation in 2011, the rate of uptake of this type of eco-account scheme has been slow, but steadily increasing. Some interviewees suggested that part of

³⁷ This advantage is also one main characteristic of compensation area pools.

³⁸ As mentioned in footnote 64, all figures are based on values without interest payment and the data used can be accessed via the eco-account registry.

the reason why the implementation of the eco-accounts under the nature conservation law has been rather slow is that the federal government is known to be working on a draft of a 'Federal compensation regulation' ("Bundeskompensationsverordnung"), which was finally published in April 2013 (BKompV 2013). The new regulation, which as of late 2014 was on ice, aimed to make the IMR more transparent and effective by further clarifying and harmonising existing requirements. The prospect of this new piece of legislation potentially being introduced has led to a legal uncertainty and the decision of a range of stakeholders not to invest into a system that might soon be overhauled.

7.3 Stakeholders involved in the eco-accounts schemes: motivations and views

7.3.1 Motivation of main stakeholder groups and reasons for getting involved

Interviewed stakeholders expressed a range of reasons for them to get involved in the development of eco-account schemes and/or make use of existing eco-accounts schemes. In general, all stakeholder groups, including private developers, administrations, municipalities and experts confirmed that they considered the temporal and geographical flexibility that the eco-accounts allow as one of the main benefits in using the eco-account schemes.

Most stakeholders also formulated a number of concerns that they saw as potentially undermining their support to the introduction and use of eco-accounts schemes.

Nature Conservation Authorities at Länder and district level

On the one hand, public authorities underlined that the eco-account schemes offer the possibility to implement larger scale, more complex nature conservation projects instead of implementing numerous, smaller individual compensation measures. Also, they allow an anticipated implementation of nature conservation measures for the compensation of residual impacts of future developments. In addition, because of the approval of compensation measures would not be directly linked with the permitting of developments, the time it takes for permitting a development could be reduced (personal communication, LUBW: Mrs. Böhm).

On the other hand, an increase of administrative costs during the early implementation phase of the eco-account scheme was considered likely due to a time-consuming familiarisation with the topic for administrators. It is however likely that, in the long run, once administration got acquainted with the new regulation, the administrative costs associated with the implementation of the IMR will be the same as before or possibly even lower (personal communication, LUBW: Mrs. Böhm).

In addition, lower nature conservation authorities (LNCAs) do not systematically recommend the use of the eco-account scheme because some developers believe that traditional compensation via the IMR is still a more convenient alternative to using the eco-account under nature conservation legislation and that compensation measures under the eco-account need to obey stricter criteria than the traditional compensation measures via the IMR (personal communication, district office of Offenburg: Mr. Müller).

Municipalities

Interviewees from municipalities pointed out that using eco-account schemes (both under the building law and under nature conservation legislation) has helped reduce time pressure related to the traditional in-kind and on-site compensation during the development approval procedure. This is because anticipated compensation measures have already been elaborated, approved and sometimes even already carried out, and need only to be attributed to the residual impact in question. The eco-account therefore is regarded as a tool that may save time and shorten administrative procedures (personal communication, municipality of Ottersweier: Mr. Pfetzer; municipality of Steinach: Mr. Edelmann).

However, municipalities with an eco-account under the building law in place showed a rather limited interest in creating and/or using an eco-account under nature conservation law, as the compensation of major residual impacts on a municipal level in most cases fall under the eco-account under the building law anyway (personal communication, urban administration of Heidelberg: Mr. Schäfer).

Private developers/ companies

Private developers referred especially to the reduced number of conflicts between different land user groups as a major reason for using the eco-account scheme. Via an anticipated deliberative approach, suitable land with a high ecological improvement potential can be identified with adequate time to consult with potentially affected land user groups. Developers also mentioned service packages provided by external compensation agents (e.g. compensation agencies) as time- and cost-efficient solutions to externalise off-setting (personal communication, DB ProjektBau GmbH: Mrs. Börsting-Flister). In addition, companies whose activities/developments cause impacts on a large-scale (e.g. mining operations) are aware that they might improve their image and ensure their “license to operate” by using the eco-accounts. This is particularly true since the Eco-account allows the pit and quarry industry or developers of energy and transport infrastructure to implement larger scale, visible anticipated off-setting measures even before the impacts of their operations arise (personal communication, Holcim Süddeutschland GmbH: Mr. Kauper).

Compensation agents and agencies

In the case of the eco-account scheme under nature conservation law, the interest payment on already implemented and stored compensation measures, which implies that the longer a compensation measure has been implemented, the more its worth in compensation credits, can be considered a further incentive to use the eco-account for compensation, especially for private compensation agents (personal communication, Holcim Süddeutschland GmbH: Mr. Kauper).

NGOs

Nature conservation NGOs consulted agreed the use of eco-accounts for nature and landscape conservation in Baden-Württemberg has not led to deterioration in the implementation of the IMR and may even have had positive effects. (LNV/NABU 2009:1; personal communication, NABU: Mr. Dr. Röhl).

Farmers

For farmers, an argument undermining the use of the eco-account scheme under nature conservation legislation are its administrative requirements, inter alia the necessity to change the property status of a lot via a specific entry in the land change registry. Furthermore, the use of communication tools (like the Internet platform informing about the eco-account scheme in BW) may not be the most efficient tool to inform this section of the population. They can even be considered as obstacles to the participation of farmers in the eco-account scheme as potential compensation agents (personal communication, LBV in BW e.V.: Mr. Schulz).

7.3.2 Qualitative assessment of the effectiveness of the eco-account scheme: A stakeholders' view

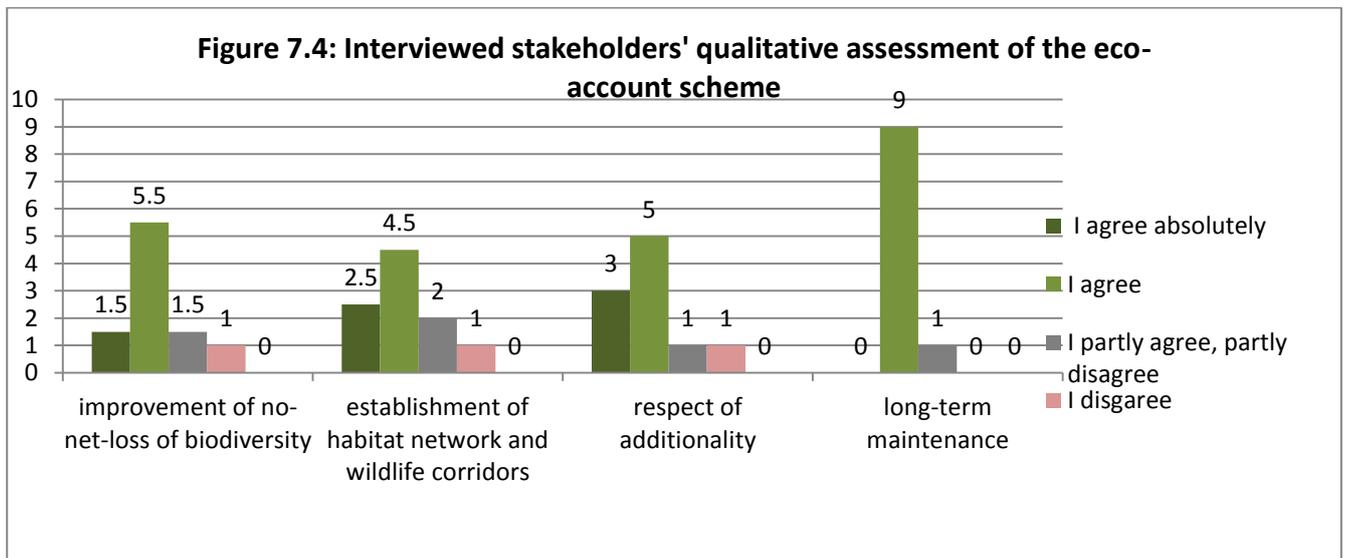
This section presents the results from an interview question using a five-point Likert-scale that was used across all questionnaires in order to collect information about the stakeholders' attitude towards the eco-account scheme. Statements concerning the improvement of the no net loss principle, the creation of habitat network and wildlife corridors, the creation of additional value for biodiversity and long-term maintenance of habitats were included. Stakeholders were asked to choose an answer from a five-point scale ranging from “I agree absolutely” to “I disagree absolutely”.

In general, interviewed stakeholders evaluated the eco-account scheme as an efficient tool to achieve the no-net-loss principle, to create habitat networks, to create an additional value for biodiversity and long-term safeguarded habitats (see Figure 7.4).

Regarding the eco-account's effectiveness in achieving the no net loss principle, interviewees considered that in theory the eco-account scheme has the potential to avoid a further loss of biodiversity, but in practice more efforts need to be done to realise this objective. The same is valid for the second statement concerning the creation of habitat network. Interviewees pointed out that the eco-account regulation established this theoretical principle, but in practice this goal is not yet implemented to a satisfactory extent.

Stakeholders agreed also on the third statement referring to the additionality of compensation measures under the eco-account scheme by underlining that in theory this requirement is well established, but in practice still certain exceptions exist, especially under the eco-account under the building law.

Finally, interviewees seem to be convinced that the eco-account offers the possibility to ensure the long-term maintenance of the implemented compensation measures.



8 ASSESSMENT OF THE ECO-ACCOUNT SCHEMES

This chapter provides a synthesis assessment of the eco-account scheme using as a starting point the research hypotheses outlined at the beginning of this report. The objective is to analyse to which extent the eco-account schemes may contribute to achieving the commitment to no net loss of ecosystem services and biodiversity.

8.1 The effect of eco-accounts on the adherence to the mitigation hierarchy

The effect of the eco-account scheme on the adherence to the mitigation hierarchy will be explored in light of the first two research hypotheses:

H1: The eco-account scheme internalise the costs of biodiversity loss and thus helps to reduce impacts on biodiversity

H2: The eco-account scheme does not lead to a weakening of adherence to the mitigation hierarchy through a tendency to compensate for impacts where this has a lower cost than avoiding or reducing them (i.e. becoming a 'license to trash').

H1 implies also that there is scope for developers to minimise the costs from mandatory offsetting by taking the ecological value of land (and therefore potential costs of compensation) into account when choosing where to locate their developments. There may also be strong economic incentives to avoid compensation cost by more thoroughly avoiding or minimising residual impacts in the first place, in which case offsetting supports the mitigation hierarchy. However, it is important to note that economic incentives may also undermine the mitigation hierarchy in situations where avoidance or mitigation costs are higher than compensation costs, which can often be the case.

The eco-account schemes as instruments to implement the IMR do not, strictly speaking, make a particular (additional) contribution to internalising external costs, beyond the contribution the IMR makes by introducing the requirement for developers to compensate residual impacts. As far as they facilitate meeting the requirement for compensation under the IMR they can however be considered to make it easier for developers to fulfil the requirements to fully offset residual impacts. This can potentially be seen as an aspect that could weaken the mitigation hierarchy if one considers that the eco-account schemes, by facilitating the offsetting of residual impacts, may make it easier for authorities to approve a development which otherwise would not have been approved due to the impossibility to fully offset residual impacts in a satisfactory manner. At the same time, relying on eco-accounts schemes to offset residual impacts does not per se undermine the logic established by the IMR according to which developers need to strictly adhere to the mitigation hierarchy. The system put in place through the IMR, including when implemented via eco-account schemes, should in principle increase costs to the developer of carrying out a development without attempting to minimise adverse impacts of a development on biodiversity and ecosystem services as far as possible. Whether or not the price of offsetting ends up being adequate and sufficient to encourage developers to strictly follow the mitigation hierarchy is a question that is more difficult to answer. First of all, whether or not the eco-account schemes are used, it depends on how strict authorities are in ensuring that the mitigation hierarchy has been followed when deciding whether or not to authorise a development. Second, since the long-term monitoring of the compensation measures by public authorities is insufficient, developers are at least in some cases likely to anticipate that they will most probably not be required to invest as much as they should to maintain the compensation measures in the long run.

This ambiguity is also reflected in the views expressed by stakeholders on the ground which suggest that even though, from a purely legal point of view, adhering to the mitigation hierarchy is required

by law, in practice, the resulting costs for compensation might not provide enough incentives to strictly adhere to the mitigation hierarchy (H1 and H2). While some interviewees stressed that from a purely legal point of view not adhering to the mitigation hierarchy is not an option given it is a legal obligation (personal communication, district office of Offenburg: Mr. Müller) other interviewees confirmed that in practice developers tend to go straight to the last level of the mitigation hierarchy without sufficiently considering impact avoidance and minimisation (personal communication, FVA: Mr. Waldenspuhl, Municipality of Donaueschingen: Mr. Dr. Bronner). Thus, it is unclear to which extent authorities are in a position to systematically enforce adherence to the mitigation hierarchy. In addition, this suggests that the price for off-setting might not be high enough relative to avoidance and mitigation measures to ensure a satisfactory adherence to the mitigation hierarchy. No evidence was found of developers consciously deciding to locate their development on land of a low ecological value in order to minimise the costs associated with compensating residual impacts. In the few instances information on the cost was available (see section 7.4.); these did not seem to reach levels that would, in the grand scheme of things, encourage developers to make them an important factor to consider when deciding where to locate their development.

As regards H2, in theory the eco-account scheme does not lead to a weakening of the adherence to the mitigation hierarchy, as it is meant to be a tool to overcome barriers to meeting the commitments under the IMR and it does not allow for neglecting avoidance and minimisation of impacts. These should have been taken into consideration before using the eco-account scheme. Ultimately, it is not clear whether the risk that the mitigation hierarchy is not followed increases with the use of eco-account schemes. While the obligations to offset residual impacts remain unchanged and the scope for nature conservation authorities to ensure equivalence is the same as under traditional compensation, the purpose of the eco-accounts is also to facilitate meeting offsetting requirements under the IMR and to do so cost-effectively. This suggests that in a well-functioning eco-account scheme under the nature conservation legislation, competition between different compensation agents may ultimately lead to a fall in the cost of compensation and therefore make compensation increasingly cheaper relative impact avoidance and mitigation. Such a development would indeed risk undermining the mitigation hierarchy. Hence, H1 and H2 are only partially verified and it seems that the eco-accounts do not offer sufficient guarantees to ensure that the cost of compensation creates an incentive for strictly sticking to the mitigation hierarchy and the way in which it creates of a market for compensation may ultimately make compensation less costly, thus potentially even reducing incentives to avoidance and mitigation.

8.2 Verifiability of the quality, additionality and duration of the compensation measures under the eco-account scheme

The project's team's third research hypothesis (H3) was that *"the eco-account scheme is a transparent and fair (1) tool for compensating for unavoidable residual impacts (thereby having the potential to ensure no net loss of biodiversity and ecosystem services) through measures that provide measurable additional (2) long-term (3) benefits."* The extent to which the research confirmed the different elements (1-3) included in this hypothesis is discussed in this section.

8.2.1 Transparency and fairness of the compensation measures

It is best to look at the two types of eco-account schemes separately to assess the extent to which the eco-account schemes can be considered transparent and fair tools. The eco-account under the building law seems to meet this criterion only to a limited extent. Some elements undermining transparency and fairness are the heterogeneous landscape of coexisting evaluation models, a limited exchange of information between different administrative hierarchy levels and a missing overview about implemented compensation measures. LNCAs on a district level where not in a

position to say which municipalities use eco-accounts. Therefore transparency is rather low³⁹ and hence fairness in the use of this type of eco-account is both difficult to ensure and verify.

The eco-account under nature conservation law, whose design was meant to overcome some of the deficiencies of the eco-account under the building law, is much more straightforward and transparent as regards the criteria to be applied. On a regional level, the following elements ensure higher fairness and transparency with respect to the eco-account under the building law: 1) standardized forms and administrative procedures; 2) a central compensation/eco-account registry allowing public insight into key information relating to the registered compensation measures, which includes GIS-information (e.g. maps from the land register), 3) common metrics and a homogeneous evaluation model. Especially the insight into the compensation/eco-account registry by third parties, like citizens or nature protection associations, has the potential to complement the control function of public authorities. It has been recommended that the standards under this eco-account be also used for the eco-account under the building law. This could lead to an increase in transparency and increase in fairness in the latter type of accounts.

8.2.2 Additionality of compensation measures

The German Nature Conservation Act and more specifically the IMR, that is the basis for the establishment of the eco-account schemes under nature conservation law, includes provisions that are meant to ensure additionality. As a result, only compensation measures that provide an added value (see 6.3.1) may enter the scheme. Measures that would have been carried out anyway (“Sowieso-Maßnahmen”) due to legal requirements (e.g. in agriculture or forestry) as well as pure maintenance measures (“Erhaltungsmaßnahmen”) are excluded from the eco-account scheme under the nature conservation law. Arguably this should exclude off-setting in Natura 2000 or other areas where obligations to maintain biodiversity in good conservation status exist. Despite these legal requirements in the German Nature Conservation Act the regulation establishing the eco-accounts in Baden-Württemberg explicitly states that measures to improve the condition of habitats of a high value or create such habitats in Natura 2000 and other protected areas qualify for registration as compensation measure in the eco-account registry (see Annex I of ÖKVO 2011). Interviewees confirmed that in practice certain LNCAs allow for areas in Natura 2000 areas to be registered as eco-account measures in the compensation registry (personal communication, FVA BW: Mr. Dr. Waldenspuhl).

Certain grey zone exists in the context of the eco-account under the building law which may not always be specific enough to ensure strict additionality. In contrast, the eco-account under nature conservation law ensures strictly the additionality via the eco-account regulation (ÖKVO 2011: §3(4)). It has been implemented over too short a period, however, to draw definite conclusions as regards the extent to which these safeguards ensure the additionality of compensation measures in practice.

8.2.3 Long-term maintenance and monitoring of compensation measures

H3 (3) relates to the extent to which the long-term benefits of the implemented compensation measures for biodiversity are ensured via monitoring and control under the eco-account schemes. According to the literature, at the beginning of the 1990s a range of studies suggested that there was a deficit in the implementation of compensation measures, especially in the building sector, where only between 30% and 60% of the planned compensation measures were actually implemented (Peters et al., 1993; Rexmann et al 2001; Roessling 2004; Schwoon 1998; Wernick 1996). As mentioned in section 6.6.4, the 2009 amendment introduced the notion of “relevant required

³⁹ No figures are available on the number of municipalities that use the eco-account scheme under the building law in Baden-Württemberg.

period” by attributing the long-term responsibility for compensation measures to the developer. In principle, legislation clearly foresees the monitoring of compensation measures and the implementation of necessary long-term maintenance measures by competent authorities, which may require developers to submit a report on the matter (BNaSchG, § 17 (7)). In addition, the 2002 amendment to the Federal Nature Conservation Act adopted a paragraph allocating legal competencies to the federal states to regulate further the maintenance and safeguarding of compensation measures (BNatSchG 2002: §18(5)). The legal frameworks regulating the control and monitoring of compensation measures, including different types of controls before, during and after the implementation of compensation measures (“Durchführungs-, Funktions- und Nachkontrolle”), thus differ from one Land to another and are relatively vague (BfN, 2006). On the ground, it seems that longer-term monitoring has been carried out (at least) to a limited extent where local authorities and the wider public have assumed responsibility and shown interest in the long-term success of the compensation measures (e.g. municipality of Steinach/Baden, municipality of Ottersweier, district office Offenburg).

Although the legal framework foresees long-term maintenance of compensation measures, this is not enforced and in practice inadequate long-term monitoring and management arguably represents one of the major weaknesses of the eco-account schemes in Baden-Württemberg, and of the IMR in general. Looking the extent to which compensation measures implemented to comply with the IMR had been maintained in Germany Jessel (2006) found that only 30% of compensation measures are maintained with high or middle grade, whereas 53% of compensation measures are not maintained (Jessel 2006: 29-30). Amongst the reasons for insufficient monitoring (during and after the implementation), the following issues were identified: inadequate design of compensation measures, false estimate of the local conditions, unclear formulation of development goals and missing human resources within the administrative system in charge of monitoring (Jessel 2006:25). It is worth stressing that, from an effectiveness point of view, even monitoring for a period of up to 10 years cannot be considered satisfactory and long-term monitoring should actually be understood as for the duration of the original impact that the compensation relates to, ie in most cases indefinitely.

It must be noted, however, that the eco-account under nature conservation law and its related compensation/ eco-account registry has the potential to offer more scope for the involvement of environmental NGOs and the wider public in the monitoring. In fact, the publication of compensation measures in a publicly available registry facilitate the verification of non-implementation cases as well as the long-term success of compensation measures.

8.3 Financial and ecological effectiveness of compensation measures under the eco-accounts in comparison to traditional impact compensation approaches

A fourth hypothesis (H4) that the project team set out to investigate was that *“the eco-account represents a more cost-efficient (1) and ecologically efficient (2) way to compensate for biodiversity loss and hence comply to a larger extent with no net loss requirements than the traditional approaches developers could choose to meet the same requirements under the Impact Mitigation Regulation”*.

8.3.1 Financial and administrative costs to developers using the eco-account scheme

In order to analyse the issue of financial effectiveness the following categories of costs were distinguished: real and administrative costs, the perception of costs, economic competitiveness and the availability of money for nature conservation measures.

Real and administrative costs

Financial costs of compensation vary depending on the case, location and the municipality. Due to the multitude of evaluation models, a quantitative comparative cost analysis between compensation measures under the traditional IMR and under the eco-account scheme cannot be carried out. However, the interviews realised can give some insight on key issues related to direct and transaction costs.

According to estimations of interviewees, between 1-5% of the direct costs of a development per m² are costs for compensation. The costs due to compensation thus represent a low percentage of the overall costs of a development. This does indeed suggest that the average development (i.e. with average type of impacts) requires a compensation of about 10 eco-points per m² (personal communications, FVA BW: Mr. Dr. Waldenspuhl, University of Economics and Environment Nürtingen-Geislingen: Mr. Prof. Dr. Küpfer, municipality of Ottersweier: Mr. Pfetzer).

As regards administrative costs (ie. the cost to public administrations), one of the research hypotheses was that the design of the eco-account scheme (under nature conservation law) could have decreased administrative cost via more time-saving procedures (e.g. internet tools). This was not confirmed in practice as interviewees considered that the costs to the administration did not really change if compensation is carried out through the eco-account tools instead of more traditional compensation approaches (personal communications, FVA BW: Mr. Dr. Waldenspuhl, district office of Heidelberg: Mr. Schäfer, Municipality of Ottersweier: Mr. Pfetzer). While overall the introduction of the eco-accounts schemes does not appear to have resulted in important cost savings for public administrations, some interviewees pointed out that the administrative effectiveness had increased through the use of the internet tools (e.g. internet platform, compensation/eco-account registry). This is certainly also linked to the fact that in order to ensure a smooth implementation and compatibility with other programs (e.g. GIS tools) the software tools initially went through a test phase in the context of a pilot project before being used more widely (personal communication, Bhm-Planungsgesellschaft mbH: Mrs. Maniyar). In addition, if one considers that the monitoring of the effectiveness of the compensation measures implemented rests with the public authorities, the fact that the eco-account under nature legislation appears to facilitate the pooling of the offsetting obligations from different developments (allowing for larger compensation measures to be implemented as opposed to a wider range of smaller and more dispersed compensation measures) the cost of monitoring may also be lower.

Finally, the introduction of a standardized evaluation model in the context of the eco-account under the nature conservation legislation has increased legal security and facilitated equal treatment. This also has benefits for developers who see a reduction in the risk of delays due to legal challenges. The reliance on quantitative approaches in the evaluation of residual impacts and compensation measures as opposed to deliberative evaluations which used previously also in some instances reduced the human resources required (personal communication, FVA BW: Mr. Dr. Waldenspuhl).

While for public administrations costs have remained relatively stable, for developers, the co-existence of different compensation regimes across borders means that the administrative costs of (larger scale) development projects for which residual impacts that require compensation arise in different habitat areas, districts or regions are higher than they would be if common evaluation models and metrics were used across the different types of eco-accounts (e.g. Holcim Ltd.).

Influence of the eco-account scheme on economic competitiveness of municipalities

The extent to which the introduction of the eco-account scheme had an effect on the economic competitiveness of a municipality was also explored. None of the interviewees confirmed that the

introduction of the eco-account scheme in a given municipality would have a negative effect on the local economic competitiveness in the sense that investors would relocate their investments (personal communication, RVBO: Mr. Franke, Municipality of Ottersweier: Mr. Pfetzer, etc.). This can be explained by the fact that the obligation to compensate imposed by the IMR applies and should be enforced to the same extent all over Germany and that municipalities which have an eco-account in place do not oblige developers to use it if they wish to compensate their residual impacts through other means. On the contrary, municipalities that use the eco-account may actually be attractive also from an economic competitiveness point of view, as the existence of an eco-account also suggests potential for streamlined administrative procedures and the time-saving attribution of already implemented compensation measures to future impacts (e.g. in Steinach/Baden the administrative procedure to acknowledge the construction of a new industrial zone took only two weeks) (personal communication, Municipality of Steinach: Mr. Edelmann, Mrs. Stöhr).

Availability of money for nature conservation

Interviewees did not seem to consider that the introduction of the eco-account schemes resulted in an increase in the flow of money going into nature conservation and restoration activities linked to a better and more systematic implementation of compensation measures required under the IMR. Interviewees were nevertheless more willing to confirm that available means may have been used more efficiently where eco-accounts were used to make use of the possibility offered by the IMR to allow off-site and pooled compensation to create larger areas of habitat in the strategically best ecological areas (personal communication, Mr. Müller). This is particularly true because the baseline eco-accounts needs to be compared with is a state of rather widespread difficulty in enforcing the obligation to compensate under the IMR because of lack of flexibility in meeting the compensation obligations.

In summary, H4 (1) can be partially verified. On an administrative level, the introduction of the eco-account under nature conservation law, where used, seems to have resulted in some improvements as regards time and cost savings but not in a significant overall reduction of administrative costs to the public sector. In the area of long-term monitoring of the compensation measure's implementation, however, there is true potential to allow for increasing cost-effectiveness. While the costs of meeting their obligations under the IMR does not appear to have increased for developers, it seems that the use of eco-accounts has in some instances allowed a more transparent and pooled use of the money spent on the offsetting of residual impacts and therefore increased cost effectiveness

8.3.2 Ecologic effectiveness/ biodiversity benefits

In this section, we summarise evidence that help verify the research hypothesis H4 (2), i.e. *the eco-account scheme improves the effectiveness of managing compensation for biodiversity loss by leading to expanded and restored habitats and by contributing to an enhancement of an ecological network by creating more, bigger, better and joined areas for biodiversity* (H4 (2)).

In theory the eco-account scheme ensures ecological added value through its design, in particular the rule according to which only measures with high ecological improvement potential can enter the scheme (see 6.1. and 8.2.2). To determine the benefits for biodiversity promoted by the eco-account scheme we analysed the eco-account registry and chose the following two indicators: the impact-compensation-relation and the creation of habitat networks.

Impact-compensation-relation

The following figures concern only the eco-account under the nature conservation law (figures on the eco-accounts scheme under the building law were not available to the study team). Evidence was found of compensation measures in the eco-account registry having been attributed to the impacts

of several developments (ie residual impacts which, presumably, in the absence of the eco-accounts would have been offset by the implementation of on-site smaller scale/isolated compensation measures). An analysis of the value of the average compensation measure in the the eco-account and the value of the average residual impacts from a development to be offset via the eco-account also offers some insights. The average eco-point value of an implemented compensation measure is about 225 906 eco-points⁴⁰ and on average the surface covered by a compensation measure is 8 581 m². The average eco-point value of an attributed impact is about 145 222 eco-points. This means that, on average, one compensation measure is attributed to 1.56 impacts and suggests that the eco-account scheme results in the implementation of larger compensation measures that may be used to compensate a wider range of smaller impacts than would otherwise have been offset in isolation, with lower benefits to biodiversity. This also has implications for the cost-effectiveness of impact compensation via the eco-account schemes as larger measures may be monitored more cost-effectively in the long run by public authorities (see section 8.3.1).

Creation of habitat networks

The creation of habitat networks and wildlife corridors⁴¹ is established in the Federal Nature Conservation Act 2009, which states that at least 10% of every federal state's area should include habitat networks (BNatSchG 2009: §20). In the context of the IMR, the Federal Nature Conservation Act requires that when identifying land to implement compensation measures, the potential of the land to help re-connecting habitats should be considered (BNatSchG 2009 §15 (3)). The eco-account regulation does not refer explicitly to habitat networks. However, Annex 1 of the regulation establishes that restoration measures that may qualify as eco-account measures include those that improve the state of habitats or create new habitats in Natura 2000 areas or other protected areas and measures that have been carried out in the context of landscape plans in non-protected areas.

The interviews carried out suggest that in theory the eco-account scheme follows the objective of improving the habitat network and creating wildlife corridors. The use of landscape planning tools and compensation area pools in order to identify lots with high improvement potential on which to carry out compensation measures offers room for specifically selecting lots that are likely to result in synergies with natural assets in the surrounding landscape (personal communication, University of Economics and Environment Nürtingen-Geislingen: Mr. Prof. Dr. Küpfer). In practice, however, compliance with this objective is difficult to ensure due to the scarcity of available suitable land. In certain cases, where an overall "compensation concept" has been developed, the objective of contributing to the enhancement of a wider habitat network is achieved (see example Steinach/Baden or Holcim Ltd). Some interviewees considered that compensation in the context of the eco-account should remain flexible enough to accept compensation measures that do not contribute to an enhancement of the wider network, as this criterion will not always be easy to fulfil (personal communication, Flächenagentur BW GmbH: Mr. Sedlak). Farmer's representatives underline the high potential of compensation measures to contribute to the networking of isolated patches of habitats in the wider landscape (personal communication, LBV in BW e.V.: Mr. Schulz).

The fact that no eco-points are attributed specifically to the integration of compensation measures in existing ecological networks and no information on the extent to which projects meet this criterion is available in the eco-account registry, makes it difficult to assess the extent to which compensation

⁴⁰ The figures are based on the entries of the eco-account registry until the 2nd July 2013. To avoid bias, we chose to analyse only the implemented anticipated compensation measures and not to consider the planned ones as they can potentially still be deleted from the registry. All figures in eco-points are considered without interest payment.

⁴¹ See for further information about the situation of network habitat in German a common position paper of the NABU, WWF and DJV, 2002, <http://www.nabu.de/themen/artenschutz/nationalerartenschutz/wildtierkorridore/00763.html> [accessed on 02.07.2013].

measures are embedded in such ecological networks. The results of the qualitative assessment carried out for this project suggest that ecological networks are at least occasionally taken into account in the choice of where to locate compensation measures. This is particularly the case in the context of watercourses (see Dettingen example in chapter 7) as restoration projects often take place in the context of broader plans to restore the ecological integrity of rivers. Stakeholders seem to agree that the eco-accounts have a high potential to contribute to connecting habitats and the creation of wildlife corridors. In practice, adequate tools like landscape planning tools are necessary to enable that compensation measures be strategically placed in order to increase the overall effectiveness and resilience of ecological networks. Nevertheless, enough flexibility should be allowed to ensure the implementation of compensation measures even in the case that suitable land to achieve synergies in the context of a wider ecological network is not available.

9 CONCLUSIONS

9.1 The performance of the eco-account schemes in Baden-Württemberg

The results of this research project suggest that the eco-account schemes in place in Baden-Württemberg **make a contribution towards the internalisation of the external costs linked to the adverse impacts of developments on biodiversity and ecosystem service loss**. This in particular holds true as the eco-accounts schemes are meant to be tools to implement more flexibly requirements under the German Impact Mitigation Regulation (IMR), which requires developers to follow the mitigation hierarchy (but does not put a strong emphasis on favouring in-kind, on-site compensation over out-of-kind, off-site compensation). Legislation also specifies that impacts should generally not be authorised if they cannot be compensated but in case they are nevertheless authorised, a fee-in-lieu system is foreseen (and calculation methods are outlined). Ultimately, it is the IMR that needs to be credited for the internalisation of external costs rather than the eco-accounts schemes themselves, although they may facilitate the process through which this internalisation happens. At the same time the **eco-account schemes bear the risk of reducing the cost of compensation to levels that would undermine a developer's incentive to avoid and mitigate the impacts of a development whenever possible**. As far as they create a market for compensation, where developers may buy "compensation credits" from the compensation agent selling them at the lowest price, they may be seen as potentially reducing the cost of compensation, which in some instances may make cheaper to compensate residual impacts than avoid or mitigate them.

Whether the **costs that are borne by developers are fully proportionate to the residual impacts** of their development is subject to interpretation. Arguably, however, they should be, given the eco-points system, through which points are attributed to both residual impacts to be compensated and compensation measures broadly covers the main assets (species/habitats, soil and water). The eco-points system underpinning the eco-accounts also appears to offer only **limited scope for accounting for the variation in the value of ecosystem services depending where these services (eg how close to potential beneficiaries) are delivered**. In addition, ordinary biodiversity (ie. understood as species that are not protected) is only insufficiently covered per se but may nevertheless be restored if this is considered instrumental to the restoration of specific ecosystem functions whose restoration is required under the IMR. In principle, however, the use of the **eco-account system is more likely to lead to an improvement of biodiversity with respect to on-site traditional compensation projects, especially since it builds on relatively transparent metrics (in particular the eco-account established under the nature conservation law) and facilitates the pooling of compensation of residual impacts from several smaller developments**, facilitating the implementation of larger compensation measures (compared to the size of the on-site compensation measures which would have been implemented in the absence of the eco-account schemes), which can make a higher contribution to overall ecosystem resilience.

The insufficient **long-term monitoring of the effectiveness of the implemented compensation measures** is most likely a factor that results in lowering costs associated with compensation below adequate levels. However, this problem is not specific to compensation measures implemented under the eco-account schemes. It is also clear that this is more an issue of sub-optimal implementation as, in principle, legislation clearly foresees the monitoring of compensation measures by competent authorities (BNA SchG, § 17 (7)), although it is the competency of federal states to further regulate the maintenance and safeguarding of compensation measures. It clearly states that the relevant authorities are responsible for checking the timely implementation of avoidance as well as compensation measures including the necessary maintenance measures. Actually, given the improved transparency associated with eco-account measures through the use of

the compensation registries and the fact that eco-account measures tend to be of a larger scale, it is potentially even more likely that the eco-account system offers more scope for cost-effective long-term monitoring than traditional on-site compensation measures.

It must however be noted that in practice the current costs for compensation might not provide developers with enough incentives for strict **adherence to the mitigation hierarchy**. Interviewees indeed confirmed that developers have the tendency to go straight to the last level of the mitigation hierarchy, without sufficiently considering impact avoidance and minimisation. For example, no evidence was found that developers decide to locate their development on land with low ecological value in order to minimise the adverse impacts they will have to compensate. Once more, it must be stressed, however, that this insufficient adherence to the mitigation hierarchy cannot be attributed specifically to cases in which developers meet their obligations using the eco-account schemes; it is a challenge in the implementation of the IMR more generally, irrespectively of the approach chosen for impact compensation. The risk involved in the eco-account tool making impact compensation more cost-effective (developers may have the option of choosing out of a range of different compensation measures that are offered at different prices) is that impact compensation may in certain cases become relatively cheaper than impact avoidance and compensation. That said, using an eco-account scheme does not exempt developers from their obligation to have fully adhered to the mitigation hierarchy and ensuring adherence of developers to the mitigation hierarchy rests with the public authorities in charge of authorising developments.

As regards the extent to which the eco-account tools enhance **transparency of compensation**, the eco-account under nature conservation law, whose design was meant to overcome some of the deficiencies of the eco-account under the building law, is much more straightforward and transparent as regards the criteria to be applied. This is because of the following characteristics: a) standardized forms and administrative procedures, b) a central compensation/eco-account registry allowing public insight into key information relating to the registered compensation measures including GIS-information (e.g. maps from the land register), c) a common unit of currency of compensation credits, d) a homogeneous evaluation model. In particular, the possibility of using the compensation/eco-account registry that is provided to third parties, like citizens or nature protection associations, has the potential to complement the control function of the public authorities.

Another point that has been discussed is the degree of **additionality of the compensation measures**. While the legislation establishing the eco-account schemes, in line with the Nature Conservation Law, exclude ordinary maintenance measures and measures that have been implemented to meet other legal obligations additionally could be undermined by the fact that the regulation establishing the eco-accounts under the nature conservation legislation in Baden-Württemberg explicitly states that measures to improve the condition of habitats of a high value or create such habitats in Natura 2000 and other protected areas qualify for registration as compensation measure in the eco-account registry (see Annex I of ÖKVO 2011). At the same time, a range of provision in the regulation establishing the eco-account under nature conservation law are meant to contribute to ensuring additionality (ÖKVO 2011: §2 (3)). However, it has not been implemented for long enough to draw definite conclusions as regards the extent to which these safeguards ensure the additionality of compensation measures in practice. In the context of the eco-account under the building law certain grey zones potentially reducing additionality also seem to exist.

The lack of **long-term maintenance of compensation measures** and of adequate monitoring in the long-term appears to be one of the weaknesses in the way the Impact Mitigation Regulation (IMR) is being implemented. The compensation measures implemented through the eco-account system are not an exception to that, although the use of the eco-account does not seem to exacerbate the problem. On the contrary, the increased transparency associated with the compensation registry

should help with holding those responsible for the long-term management of a compensation measure accountable and to request additional efforts where the compensation measure does not lead to the anticipated outcomes (which served as a basis in the attribution of eco-points). At present, monitoring is insufficient and sanctions appear to have been only very rarely applied. The persistent barrier of limited resources available for long term monitoring in public authorities (in this case more specifically the lower nature conservation authorities) is likely to continue to be an issue. The transparency offered by the compensation registries may help overcome this problem by creating the possibility for environmental NGOs to become more active in the field of auditing compensation measures and checking that they delivered what was promised, but there is no formal process in place for such a role at the present stage.

Available data on costs do not allow performing a quantitative analysis of the **economic effectiveness of the eco-account schemes**. This kind of data is difficult to obtain as it would require developers and compensation agents to disclose such information. However, most of them are reluctant to do so. Interviewees estimated the costs of compensation to range between 1 and 5% of the real costs of a development. There is no data however to compare this with traditional approaches to compensation.

Administrative costs are the same as in traditional compensation projects, probably also because the eco-accounts would have to be more widely used to achieve economies of scale. The standardised evaluation model that has been introduced has however increased legal security.

As using the eco-account schemes to compensate for impacts remains discretionary in municipalities that have put them in place, having such schemes does not reduce a municipalities' competitiveness/attractiveness for developers. On the contrary, some companies might perceive it as an asset as it bears the potential to streamline administrative procedures and save time due to the possibility to attribute already implemented compensation measures to possible residual impacts of a development. In general, the overall amount of financial means for nature conservation projects/measures does not seem to have increased since the introduction of the eco-account schemes, but interviewees suggested that the efficiency of using available means may have increased due to a better targeted investment in nature conservation offering higher benefits for biodiversity.

As regards the **ecological effectiveness** of the eco-account schemes, it seems that the eco-account under the nature protection law have allowed implementing larger compensation measures that have been used to compensate a wide range of small impacts. Without the eco-account, these impacts would have been offset in isolation, with lower benefits to biodiversity. An analysis of the implemented compensation measures that have been attributed to impacts showed that on average one compensation measure was used to compensate for the residual impacts from 1.5 developments.

The legal framework in theory encourages considering the **potential of enhancing existing ecological networks** when choosing where to locate compensation measures (eco-account measures should be planned in a way that ensures they are sufficiently spatially connected and ideally linked to spatial plans or strategies to establish a green network). The eco-account scheme does however not provide specific incentives to do so. The attribution of eco-points remains the same, whether or not the compensation measure delivers wider benefits in the context of an ecological network because of its strategic location (although, arguably, a good location of a compensation measure may indirectly lead to a higher attribution of eco-points, e.g. by increasing the likelihood that particularly valuable species will benefit). This is for example acknowledged in the conditions for the recognition of compensation measures that are meant to foster specific species, which includes that the species targeted occurs within relatively close proximity. In practice, examples exist in which compensation

measures were placed strategically, but the compensation registry does not provide information that would allow knowing the exact share of compensation measures that enhance an ecological network. Most interviewed stakeholders call for keeping the system flexible and not making it a requirement to strategically locate the compensation measure. This is because in many cases it would be difficult to meet such requirement, given the limited availability of land on which to implement the compensation measures.

As regards the time dimension, the eco-account under the nature conservation law does not yet fully work as a habitat bank: in most cases the implementation of the compensation measures in the eco-account registry only starts once the compensation measure has been attributed to an impact. The scheme offers an incentive for an early implementation of the compensation measure by allowing for an interest rate of 3% per year on registered compensation measures that have already been implemented (ie. the number of points originally attributed to a compensation measure increases by 3% a year starting from the moment the registered compensation measure has been implemented and until its eco-points are actually attributed to a residual impact). In most cases, however, this does not appear to be a strong incentive leading to an early implementation of compensation measures. To minimise the risks and secure the funding to implement the compensation measures, compensation agents usually wait until the registered measure has been attributed to an impact and they have received a payment. Nevertheless, the ecological effectiveness of (anticipated) compensation measures carried out via the eco-account may be better secured, in comparison with traditional compensation measures, by the requirement for compensation agents to provide information on the state of the compensation measure and its value in eco-points when it (finally) gets attributed to an impact.

9.2 Conclusions on the potential contribution to implementing the EU NNL principle

To what extent could schemes such as the eco-accounts contribute to ensuring no net loss of biodiversity and ecosystem services? This case study has shown that the eco-account schemes help overcome a range of practical barriers to compensating residual impacts arising from developments (as required under the IMR). In particular, the more recent scheme that was designed to implement the requirement for compensation under the nature conservation legislation attempts to overcome potential risks, such as those related to additionality but arguably could go even further (see above). Other issues that remain problematic, such as insufficient long-term monitoring of implemented compensation measures or missed opportunities for adhering strictly to the mitigation hierarchy, are not specific of the eco-account tool.

The publicly available compensation registries that were introduced alongside the eco-account tool bear the potential to improve long-term monitoring provided public authorities recognise the need to invest more resources into such activities. In addition, it is also the public authorities' responsibility to require developers to demonstrate that they have respected the mitigation hierarchy. The eco-account scheme in place in Baden-Württemberg is primarily designed to offset impacts on a selected range of ecosystem functions/assets and while biodiversity loss is being offset via the scheme, this is meant to restore related ecosystem functions rather than biodiversity per se. Nothing prevents, however, to expand the scope of the instrument in order to include the restoration of both protected and non-protected biodiversity.

10 GLOSSARY

Additionality: the need for a compensation measure to provide a new contribution to conservation, additional to any existing values, ie the conservation outcomes it delivers would not have occurred without it (McKenney and Kiesecker, 2010).

Area pool (“Flächenpool”): see compensation (area) pool

Accompanying landscape conservation plan: (“landschaftspflegerischer Begleitplan”)

Compensation agency (“Flächenagentur”): Compensation agencies are novel service providers mainly managing compensation pools, but also proposing a range of related specific services like planning, implementation and maintenance of compensation measures as well as land securing (“Flächensicherung”) and the coordination with involved stakeholders. They are acting as an interface with nature conservation, developers, land owners and land users. In 2006, the Federal Association of Compensation Agencies in Germany (“Bundesverband der Flächenagenturen in Deutschland (BFAD) e.V.”) was found to link existing agencies on a federal level and to represent their interests (BFAD 2008: 1). According to detailed findings from DARBI, this new actor is not *“one new homogeneous compensation services provider but a multitude of different types”* (For further information see Darbi 2011 and Darbi 2010).

Eco-account (“Ökokonto”): There is no official, legal definition. It describes a pool strategy where compensation and Ersatzmaßnahmen (off-setting measures) are carried out before and on another place where the impact takes place (cf. Spang/ Reiter 2005: p. 22)

Measure pool (“Maßnahmenpool”): see compensation pool

Compensation (area) pool (“Kompensationsflächenpool”): In German one distinguishes between “area pools” serving as safeguarding of the availability of land by buying, leasing or registering a lot in the land change registry (“dingliche Sicherung”) and “measure pools” which refer rather to the implementation of compensation measures which are already attributed to an impact or which are not yet attributed. To avoid the risk of amalgamation in the practical language use, the term “compensation (area) pool” is used encompassing both previously discussed nuances (Bruns et al. 2001 quoted after Spang/ Reiter 2005: 21). In our paper the terms “compensation area pool” and “compensation pool” are used interchangeably.

Intercommunal compensation area pools are area pools where either pool operators and/or users are more than one municipality or where the land integrated in such a pool is owned by more than one municipality. **Regional compensation area pools** are defined as larger area pools where the pool operator acts as corporative body with intercommunal competence (e.g. district, interest groups, road construction office), or with intercommunal business operations (non-profit land associations/organisations for rural development at a regional level (“Länder”-level), under form of a limited liability company = “gemeinnützige

Landgesellschaft“) or on the basis of an intercommunal agreement. (cf. Spang/Reiter 2005: p. 23).

Pool of appropriate lots: In the context of the building law eco account, lots that are appropriate and available to carry out compensation measures are pooled in a “pool of appropriate lots”/“Flächenpool” (DE). When areas of high ecological potentials are identified, these areas have to be further investigated: the availability of the lots has to be cleared and the measures have to be planned in detail (Landesanstalt für Umweltschutz Baden-Württemberg 2005). Most of the parcels of land (or lots) in the countryside are private properties. For example, maybe 7 out of 100 lots of high potential are municipal and another 3 are easily available from private landowners. These 10 lots are then defined as PAL (pool of appropriate lots). Lots that are not available cannot be taken into the PAL or even into the eco-account. If there are no appropriate lots in public ownership, the municipality buys such lots from private landowners to fill the PAL. It is important to have enough lots in the PAL to reduce price speculation (Küpfer 2012, p. 2).

Impact/intervention: In the context of the IMR and therefore the eco-accounts it should be understood as follows: According to §14 (1) Federal Nature Conservation Act 2009 an impact/ intervention is defined as follows: *“Interventions in nature and landscape, as defined in this Act, shall refer to any changes affecting the shape or use of areas, or changes in the groundwater level associated with the active soil layer, which may significantly impair the performance and functioning of the natural balance or landscape appearance”* (unofficial translation by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety 2009: p. 21). From the outset, agricultural, forestry interventions and interventions related to fishery are excluded from the scope of the Federal Nature Conservation Act according to §14 (2)⁴², consequently from the entire impact mitigation regulation as well as from the necessity to compensate impacts as long as the criterion of “good practice” is respected.

Compensation/Off-setting: Generally, compensation is a recompense for some loss or service, and is something which constitutes an equivalent to make good the lack or variation of something else. It can involve something (such as money) given or received as payment or reparation (as for a service or loss or injury). Specifically, in terms of biodiversity, compensation involves measures to recompense, make good or pay damages for loss of biodiversity caused by a project. However, it should be noted that compensatory measures, as referred to in Article 6(4) of the Habitats Directive are analogous to offsets.

According to §15 (2) BNatSchG, the intervening party is obligated to compensate for any unavoidable adverse effects by means of nature conservation and landscape management

⁴² (2)

The use of soil for agricultural, forestry and fishing purposes shall not be deemed an intervention, provided the purposes of nature conservation and landscape management are taken into account. The use of soil for agricultural, forestry and fishing purposes corresponding to the requirements specified in Article 5 (2) to (4) of this Act, and to the rules of good practice as defined in the laws on agriculture, forestry and fishing as well as in Article 17 (2) of the Federal Soil Conservation Act, does not, as a general rule, contradict the purposes of nature conservation and landscape management. (cf. unofficial translation by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety 2009: p. 21)

measures (compensation measures) or to substitute them in some other way (substitution measures). An adverse effect shall be considered to have been compensated as soon as the impaired functions of the natural balance have been restored in an equivalent way and landscape appearance has been restored or re-designed in a manner consistent with the landscape. An adverse effect shall be considered to have been substituted as soon as the impaired functions of the natural balance, in the relevant natural area, have been restored to an equivalent value and landscape appearance has been re-designed in a manner consistent with the landscape.

Mitigation hierarchy: a hierarchical procedure where appropriate actions are taken in the following order: avoidance, reduction/minimisation, restoration/rehabilitation and offsetting. According to §15 (1) BNatSchG 2009 (1) (“Entscheidungskaskade der Eingriffsregelung”) the intervening party is obligated to refrain from causing any avoidable adverse effects on nature and landscape. Adverse effects shall be considered avoidable if reasonable alternatives are available for achieving the purpose of the intervention, at the same location, with lesser or no adverse effects on nature and landscape. Where adverse effects cannot be avoided, reasons for such unavoidability must be provided.

The **deliberative approach** (“verbal-argumentativer Ansatz”) is nearly not standardized and can be easily adapted to different cases. This method is designated to evaluate individual/single cases. This approach is often used in combination with another method.

Habitat-hectare-model/ “biotope valuation procedure” (“Biotopwertverfahren”) is characterised by an „Schutzgut“= orientated evaluation before and after the impact takes place which is multiplied by the concerned surface. SOLL-IST WERT ANALYSE. This is probably the most frequently used method in combination with the verbal-argumentative evaluation.

The **compensation factor model/** “compensation area model” (“Kompensationsfaktoren-Modell”) attributes a factor/ coefficient to every impact depending on the biotope which are then multiplied with the surface (e.g. of the biotope) to calculate the surface of a compensation measure.

The **development cost approach** / “cost of restoration-approach” („Herstellungskostenansatz”) implies the calculation of the cost of the by an impact destroyed habitat by setting up a sum of a fictitious compensation measure to restore the habitat that has been destroyed. This approach is especially used for so-called linear or punctual compensation measures where the size of the compensation measure is too small to reflect the added value (cf. Spang/Reiter 2005: pp. 48-51).

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12 ANNEXES

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ANNEX I: LIST OF INTERVIEWEES AND OTHER STAKEHOLDERS CONTACTED

List of interviewees:

Stakeholder Group	Name	Institution	Position
Expert	Prof. Dr. sc. agr. Christian Küpfer	University of Economics and Environment „Hochschule für Wirtschaft und Umwelt Nürtingen-Geißlingen“; Planning office „StadtLandFluss“	Director of the Institute “Landscape and Environment”, Coordinator of International Affairs; Founder of the aforementioned planning office
	Dr. Markus Röhl	University of Economics and Environment „Hochschule für Wirtschaft und Umwelt Nürtingen-Geißlingen“	Assistant
	Dr. Thomas Waldenspuhl	Research Institute of the regional forest authority in Baden-Württemberg „Forstliche Versuchs-und Forschungsanstalt“	Head of the department „Forest and Society“, former nature conservation representative
Compensation Agents	Manuel Sedlak	Compensation agency Baden-Württemberg „Flächenagentur Baden-Württemberg“	Project leader
	Dr. Markus Röhl	Compensation agency Baden-Württemberg „Flächenagentur Baden-Württemberg“	Employee
	Ludger Kaup	Holcim Süddeutschland GmbH, Dotternhausen	Director of extraction operations
	Alexandra Stöhr	Planning Office	Landscape architect and planner, in charge of eco-accounts for several municipalities in the “Ortenaukreis” district around Steinach/Baden
	Jochen Bresch	Planning Office „Bhm-Planungsgesellschaft“ Foundation „Stiftung Naturschutz“	Co-Director, Landscape Architect, Founder of the foundation “Stiftung Naturschutz”
Local administrative authorities	Armin Schott	Municipality of Villingen-Schwenningen, Office for Urban Development,	Vice Chief Officer, Head of the department for environmental development and sustainable planning
	Stephanie Siegel	Municipality of Villingen-Schwenningen, Office for Urban Development, department for environmental development and sustainable planning	Specialist for compensation measures
	Dr. Gerhard Bronner	Municipality of Donaueschingen, municipal administration	Environmental Consultant
	Frank Edelmann	Municipality of Steinach/Baden	Mayor
	Christian Schäfer	District Office Heidelberg, Office for environmental protection. trade control and energy	Specialist for habitat and landscape maintenance, water engineering, eco-account and funding guidelines
	Steffen Müller	District Office Ortenaukreis, Office for Environmental Protection	Specialist in charge of the IMR and co-accounts in the district

	Jürgen Pfetzer	Municipality of Ottersweier	Mayor
	Edmund Frietsch	Municipality of Ottersweier, municipal building authority	Head of the municipal building authority
Third parties	Dr. Markus Röhl	regional branch of the German nature conservation NGO „NABU – Baden-Württemberg“	Board member
	Dr. Gerhard Bronner	Umbrella organisation of nature conservation NGOs in Baden-Württemberg „Landesnaturausschuss Baden-Württemberg e.V.“ (LNV BW e.V.)	Board member
	Wilfried Franke	Regional corporate body inter alia in charge of landscape planning “Regionalverband Oberschwaben-Bodensee” (RVBO)	Director
	Michael Schulz,	Regional farmers’ association „Landesbauernverband in Baden-Württemberg e.V.“ (LBV BW e.V.)	Head of division for municipal and environmental law
	Manuel Sedlak	Industrial association of the pit and quarry industry Baden-Württemberg „Industrieverband Steine und Erden Baden-Württemberg e.V.“ (ISTE BW e.V.)	Project leader

List of stakeholders who supported our research project by answering certain questions (in writing/ via e-mail):

Local administrative authorities	District Böblingen, Office for Agricultural Affairs
	Hohenlohekreis, Office for Environment and Building Law
	Rems-Murr-Kreis, Department for Environmental Protection
	Municipality of Berglen
	District Schwäbisch Hall, Office for the Environment and Building Affairs, department for Nature Protection, Emission and Trade Control
	District Neckar-Odenwald-Kreis, Major District Town Mosbach,
	District Rastatt, Office for Building Law and Nature Protection
	District Breisgau-Hochschwarzwald, department for Building Affairs and Environment
	District Tuttlingen, Office for Building Law and Environment
	District Alb-Donau-Kreis, special service for Forest and Nature Protection
	District Bodenseekreis, Office for Environmental Protection
	District Ravensburg, office for Environment
	Urban District Baden-Baden, department for Environment and Trade Control
	Urban District Heidelberg, Office for Environmental Protection, Trade Control and Energy, department for Nature and Landscape Protection
	Urban District Mannheim, department for Building Law and Environmental Protection, Office for Nature Protection
	Urban District Freiburg im Breisgau, Office for Environmental Protection, Environmental Planning, Landscape Ecology and Nature Protection
	Urban District Ulm, department for Environmental Law and Trade Control
Regional Authorities	Landesanstalt für Umwelt, Messungen und Naturschutz (LUBW), Karlsruhe, Mrs. Anne Böhm + Mr. Schmidt-Lüttmann

Research Institution	Leibniz Institute of Ecological Urban and Regional Development, Dresden, Prof. Dr. Wolfgang Wende
	University of Freiburg, Institute for Landscape Preservation, Prof. Dr. Werner Konold
Compensation Agents	Planning office „Ö:Konzept Consulting“, Freiburg
	German Railways “DB Netz AG”, especially the local branch „DB ProjektBau GmbH Regionalbereich Südwest“, Mr. Michael Bressmer, Mrs. Claudia Börsting-Flister, Mrs. Dr. Valida Pinjo-Reszat and Mrs. Simone Eberle
Third Parties	Umbrella organisation of landscape preservation associations in Baden-Württemberg “Landschaftserhaltungsverbände in Baden-Württemberg“
	Gascade Gastransporte GmbH, Mr. Michale Höhlschen,, at the NNL workshop hold on 17 th May 2013 in Dresden, in cooperation with the IEEP/Leibniz Institute of Ecological Urban and Regional Development

ANNEX II: EXAMPLE OF A QUESTIONNAIRE

INVALUABLE: Feldstudie zum Ökokonto-Programm in Baden-Württemberg (mit Unterstützung von BiodivERsA im Rahmen der FP7-EFR-Net Initiative der Europäischen Kommission)

INTERVIEW-FRAGEBOGEN: Verschiedene Indikatoren zur Analyse des Ökokonto-Programms in Baden-Württemberg

Die Analyse des Öko-Konto-Ausgleichsverfahrens in Baden-Württemberg, eines der in Deutschland und Europa am weitesten entwickelten Projekte in diesem Bereich, gehört zum zweiten von drei Arbeitspaketen des INVALUABLE-Projektes. Dieses Forschungsprojekt wird von BiodivERsA finanziert, einem Netzwerk aus 21 nationalen Förderinstitutionen, die pan-europäische Forschung im Bereich des Schutzes und des nachhaltigen Managements von Biodiversität unterstützen. BiodivERsA finanziert sich über die FP EFR-NET-Initiative des 7. Forschungsrahmenprogramms der Europäischen Kommission.

Allgemein soll der Einfluss von marktbasierenden Instrumenten auf die Gestaltung und Umsetzung der Umweltschutzpolitik untersucht werden. Dabei wird im Folgenden das Ökokonto-System in Baden-Württemberg untersucht, welches darin besteht, dass zukünftige Habitat- und Biodiversitätsverluste durch Kompensationsmaßnahmen und die Zuordnung von sogenannten Ökopunkten zu einer Maßnahmenfläche, aufgewertet werden können.

Das „Institute for European Environmental Policy“ (IEEP) ist eine unabhängige Forschungseinrichtung, welche sich hauptsächlich mit den Auswirkungen politischer Entscheidungen auf Europas Umwelt, aber auch darüber hinaus auseinandersetzt. Das IEEP ist eines der zehn Partner des INVALUABLE-Konsortiums, das vom französischen „Institut du développement durable et des relations internationales“ (IDDR) geleitet wird. Der hervorragende Ruf des Institutes unter nationalen und europäischen Entscheidungsträgern basiert auf seiner anerkannten Expertise im Bereich der Umweltpolitik und betroffener Politikfelder (z.B. Landwirtschaft) sowie der Unabhängigkeit und Integrität seiner Arbeit.

Nach einer Literaturrecherche möchte das IEEP nun semi-strukturierte Interviews mit unterschiedlichen Akteuren führen, die in das Ökokonto-Programm in Baden-Württemberg involviert sind. Dabei werden historische, institutionelle, wirtschaftliche und soziale Aspekte zur Funktionsweise des Programms untersucht, um anschließend Aussagen über Governance, Leistungsfähigkeit und Wirksamkeit zu treffen.

Wir wären Ihnen sehr verbunden, wenn Sie sich ein wenig Zeit nehmen könnten, um den folgenden Fragebogen gemeinsam mit unserer Ansprechpartnerin, Frau Julia Schiller, zu beantworten.

Name, Organisation, Position des Befragten:

Kontakt details (Emailadresse/ evt. Telefonnummer) :

Wird die Anonymität aller Daten vom Befragten gewünscht? : JA NEIN

Im folgenden Fragebogen werden drei inhaltliche Abschnitte behandelt: 1. „Governance“ zur allgemeinen Funktionsweise des Ökokonten-Programms in Baden-Württemberg, 2. „Leistungsfähigkeit“ und 3. „Wirksamkeit/Effizienz“. Jeder Abschnitt ist nochmals in thematische Untereinheiten gegliedert.

1. THEMENBEREICH: GOVERNANCE/ FUNKTIONSWEISE DES ÖKOKONTOS IN BW

1.1 Geschichtliche Aspekte							
Frage 1:	<p>Haben Sie sich bereits vor der Einführung des naturschutzrechtlichen Ökokontos in Baden-Württemberg am 01.04.2011 mit dem Themenbereich (u.a. Kompensationsmaßnahmen/Eingriffsregelungen etc.) beschäftigt?</p> <p><input type="checkbox"/> JA <input type="checkbox"/> NEIN <i>(Wenn ja, dann weiter mit nächster Frage, wenn nein, dann weiter mit Frage 6)</i></p>						
Frage 2:	<p>Welches waren, Ihrer Meinung nach, die wichtigsten historischen und/oder rechtlichen Entwicklungsschritte des Ökokontos in Deutschland bzw. BW? Können Sie diese, bitte, kurz beschreiben?</p>						
Frage 3:	<p>Wer waren, Ihrer Meinung nach, die Hauptakteure bei der Entwicklung, Einführung und Umsetzung des Ökokontos? Auf welcher Verwaltungsebene würden Sie diese Hauptakteure ansiedeln? <i>(Bemerkung: Bsp. für Verwaltungsebenen: lokal, regional, national, europäisch; Bsp. für Akteure Experten, NGOs, Verwaltung/Ministerien etc.)</i></p>						
Frage 4:	<p>Wie schätzen Sie die Verteilung der Verantwortlichkeit und Rollen der oben genannten Akteure ein? Welche Akteure haben/hatten einen besonders positiven oder negativen Einfluss auf die Entwicklung der Ökokonten?</p>						
Frage 5:	<p>Können Sie sich erinnern, wie die Kompensationsmaßnahmen vorher gestaltet wurden? Wie wurden die Kriterien zur Umsetzung von Kompensationsmaßnahmen vorher erfüllt?</p>						
1.2 Vergleich mit „traditionellen“ Kompensationsmaßnahmen							
Frage 6:	<p>Haben Sie Erfahrung mit der Durchführung naturschutzrechtlichen Kompensationsmaßnahmen vor Fixierung im Baugesetzbuch in Baden-Württemberg 1998?</p> <p><input type="checkbox"/> JA <input type="checkbox"/> NEIN <i>(Wenn ja, dann weiter mit nächster Frage, wenn nein, dann weiter mit Frage 8)</i></p>						
Frage 7:	<p>Bei einem Vergleich von „älteren“ naturschutzrechtlichen Kompensationsmaßnahmen und dem neu implementierten Ökokonto, was würden Sie sagen, sind Vor-und/oder Nachteile der beiden Ansätze?</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; background-color: #d3d3d3;">Vorteile</th> <th style="width: 50%; background-color: #d3d3d3;">Nachteile</th> </tr> </thead> <tbody> <tr> <td style="height: 20px;"> </td> <td> </td> </tr> <tr> <td style="height: 20px;"> </td> <td> </td> </tr> </tbody> </table>	Vorteile	Nachteile				
Vorteile	Nachteile						
1.3 Landschaftsplanung und Ökokonten							
Frage 8:	<p><i>Einleitung: Nach unserem Verständnis sind die Ökokonten eng mit den sogenannten Landschaftsplänen verbunden. Man unterscheidet auf Bundesebene die Landschaftsprogramme, dann gibt es Landschaftsrahmenpläne auf Regierungsbezirks- bzw. Landkreisebene und auf lokaler Ebene gibt es örtliche Landschaftspläne.</i></p> <p>Können Sie mir sagen, wer diese Landschaftspläne entwickelt?</p> <p>Inwiefern ist hier Platz für Mitspracherecht der Beteiligten?</p>						

Frage 9:	Können Sie mir erklären, inwiefern Landschaftspläne auf nationale, regionale bzw. lokale Besonderheiten der biologischen Vielfalt eingehen? (z.B. wenn eine besondere Tier- oder Pflanzenart regional bedroht ist).							
Frage 10:	Werden Wiederherstellungsmaßnahmen von Biodiversität durch den Landschaftsplan orientiert/ geleitet, d.h. werden in einem Landschaftsplan für eine Wiederherstellung der Biodiversität strategisch wichtige Gebiete identifiziert? (z.B. dass ein Flächenstück an ein bereits existierendes Biotop angeschlossen wird oder dass man 2 bereits existierende Biotope verbindet). Wird das Ganze bei der Vergabe von Ökopunkten beachtet?							
1.4 Funktionsweise des Ökokontos in Baden-Württemberg								
1.4.1 Allgemeine Rahmenbedingungen für das Ökokonto (vorab)								
Frage 11	<p>Verpflichtet der rechtliche Rahmen in Baden-Württemberg den Eingriffsverursacher das Ökokonten-Programm zu nutzen oder sind "traditionelle" Kompensationsmaßnahmen noch erlaubt?</p> <p>Können Eingriffsverursacher wählen, ob sie Ökopunkte kaufen oder ob sie Maßnahmen selbst durchführen? Wenn ja, wie ist diese Wahl derzeit geregelt?</p>							
Frage 12	<p>Für welche Eingriffe benötigt man Kompensationsmaßnahmen?</p> <p>Gibt es bestimmte Kriterien oder Schwellenwerte, ab wann Kompensationsmaßnahmen notwendig werden oder sind diese Maßnahmen heute in jedem Fall notwendig unabhängig von der Größe, dem Ort und der Bedeutung/Signifikanz der Auswirkungen eines Eingriffes?</p>							
Frage 13	Welche Kompensationsmaßnahmen werden im Kompensationsverzeichnis aufgenommen? Gibt es bestimmte Kriterien? (s.ÖKVO)							
Frage 14	<p>Was sind Ihrer Meinung nach Vor- und/oder Nachteile, dass bestimmte Ausgleichsmaßnahmen vom Ökokonten-Programm ausgeschlossen wurden? Begründen Sie bitte Ihre Antwort.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Vorteile</th> <th style="width: 50%;">Nachteile</th> </tr> </thead> <tbody> <tr> <td style="height: 20px;"> </td> <td> </td> </tr> <tr> <td style="height: 20px;"> </td> <td> </td> </tr> </tbody> </table>		Vorteile	Nachteile				
Vorteile	Nachteile							
1.4.2 Verwaltungsebenen des Ökokontos								
Frage 15	a) Auf welchem Verwaltungsniveau/s wurde/n bisher Erfahrungen mit Ökokonten gesammelt? (Gemeinde, Landkreis, regional etc.?). b) Inwiefern, kann das Ökokonten-Programm, Ihrer Meinung nach, auch in einer größeren geografischen Zone umgesetzt werden?							
Frage 16	<p>a) Haben Sie bereits Erfahrung mit dem Handel von Ökopunkten zwischen mehreren Gemeinden oder auf einem höheren Niveau (überregional, zwischen Bundesländern) gemacht? <input type="checkbox"/> JA <input type="checkbox"/> NEIN</p> <p>b) Wenn ja, können Sie sagen, wie dieser "über-regionale" Handel (oder Handel "zwischen Gemeinden") reguliert wird/ rechtlich eingerahmt/ bestimmt wird?</p>							
1.4.3 Ablauf einer Ökokonto-Maßnahme und Bewertungsmethodik von Ökopunkten/Äquivalenz								

Fragen 17a-d	<p>a) Können Sie vielleicht kurz in eigenen Worten, den Ablauf des Ökokontenprogramms erläutern. (<i>In diesem Zusammenhang möchte ich Ihnen ein Schema zur Veranschaulichung zeigen und einige Detailfragen stellen.</i>)</p> <p>b) Wer bewertet die Biotope und vergibt die Ökopunkte? Müssen diese Sachverständigen/Gutachter bestimmte Qualifikationen vorweisen bzw. eine Genehmigung/Erlaubnis haben?</p> <p>c) Zu welchem Zeitpunkt muss der Maßnahmenträger Ökopunkte erwerben? (<i>zeitliche Flexibilität</i>)</p> <p>d) Wer bestimmt, wie viele Ökopunkte ein Eingriffsverursacher für eine bestimmte Maßnahme erwerben muss? (<i>z.B. Verwaltung, Ökologen?</i>)</p>
Frage 18	Wie wird der Preis eines Ökopunktes festgelegt? Verändert sich der Preis tatsächlich abhängig von Angebot und Nachfrage?
Frage 19	Was halten Sie von dem "Ökopunkt" als handelbare "Währungseinheit" innerhalb des Ökokonto-Programms (Vor- und Nachteile/ Transparenz, praktisch)? Wie realistisch ist es, in Punkten den Wert von Biodiversität wiederzugeben?
Frage 20	Wie werden Ökopunkte sowohl zu zerstörten als auch zu kompensierten Landflächen zugeordnet, d.h. wie wird dabei die Äquivalenz zwischen "zerstörten" und kompensierten Flächen bzw. zwischen einem verkauften und gekauften Ökopunkt abgesichert ?
Frage 21	<i>Eine grundsätzliche Kritik an Ökokonten bezieht sich auf das Äquivalenzkriterium, d.h. : Nehmen wir an, dass ein Lebensraum völlig zerstört wurde. Kann diese Zerstörung durch Kompensationsmaßnahmen in einem völlig anderen Lebensraum ausgeglichen werden oder gibt es bestimmte "like-for-like"-Bedingungen/Kriterien? Wenn dies der Fall ist, gibt es auch Bedingungen die einen "like-for-like or better" Ausgleich anstreben?</i>
Frage 22	Welche Regeln bestimmen die Verbindung/Beziehung zwischen Eingriff und Ausgleich (d.h. können Ausgleichsmaßnahmen irgendwo anders ausgeführt werden, solange die notwendigen Ökosystemdienstleistungen, wie Erholungsorte, Grünflächen etc. vor Ort erhalten bleiben?)
Frage 23	<p>Werden zusätzliche, äußere Auswirkungen während der Realisierung der Maßnahme mit berücksichtigt, z.B. große Baufahrzeuge, Verschmutzung?</p> <p><input type="checkbox"/> JA <input type="checkbox"/> NEIN</p> <p>Wenn ja: Muss der Maßnahmenträger auch diese ausgleichen?</p> <p>Wenn nein, wissen Sie, warum diese äußeren Faktoren nicht einbezogen werden?</p>
Fragen 24 a-b	<p>Werden Ökosystemfunktionen und -dienstleistungen (d.h. die Nutzen für den Menschen im größeren Sinne) mit in die Berechnung des Wertes von Ökopunkten eingebunden?</p> <p><input type="checkbox"/> JA <input type="checkbox"/> NEIN</p> <p>Wenn, ja: Wie? Muss dabei jede Ökosystemdienstleistung extra ausgeglichen werden (Artenvielfalt, Wasserqualität)?</p>
1.4.4 Finanzierung von Ökokonto-Maßnahmen und Regelungen zum Besitzstatus der Flächen	

Frage 25	Bezüglich des derzeitigen Ökokonten-Projektes, wissen Sie, wie die Maßnahmenträger die notwendigen finanziellen Mittel finden, um die Kompensationsmaßnahmen vorab durchzuführen, d.h. bevor dafür Ökopunkte auf dem Markt freigegeben werden können?
Frage 26	Wem gehört das Land, auf dem Kompensationsmaßnahmen durchgeführt werden, die dann im Kompensationsverzeichnis registriert werden?
Frage 27	Wer identifiziert die Flurstücke, auf denen Kompensationsmaßnahmen durchgeführt werden können? Ist das Angebot an Kompensationsmaßnahmen, die die Kriterien erfüllen, um in das Kompensationsverzeichnis aufgenommen werden zu können, ausreichend? (deckt es die Nachfrage?)
Fragen 28	<p>a) Inwiefern ist in der Ökokonten-Verordnung die Übertragung von Grundbesitz geregelt, wenn Ökopunkte vergeben wurden?</p> <p>b) Haben Sie hier bereits Erfahrungen bei der Übertragung von Grundbesitz im Rahmen des Ökokonten-Programms gemacht? <input type="checkbox"/> JA <input type="checkbox"/> NEIN</p> <p>Wenn ja, können Sie diese kurz beschreiben (positiv/negativ/Probleme)?</p>
1.4.5 Weitere Aspekte (Langfristigkeit, Anfechtbarkeit von Entscheidungen)	
Fragen 29 a-c	<p>a) Gibt es im Rahmen des Ökokonten-Programms eine Verpflichtung die Biodiversität auf den Ausgleichsflächen langfristig zu erhalten? <input type="checkbox"/> JA <input type="checkbox"/> NEIN</p> <p>b) Wenn ja, für wie viele Jahre ist eine solche Verpflichtung gültig?</p> <p>c) Wissen Sie, wer für diesen langfristigen Naturschutzansatz die Kosten übernimmt?</p>
Frage 30	Kann die Entscheidung, wie viele Ökopunkte von einem Eingriffsverursacher erworben werden müssen, von dem Eingriffsverursacher angefochten/ abgelehnt werden?
1.4.6 Motivation zur Nutzung des Ökokontos	
Frage 31	Welche Gründe motivieren Sie, als Gemeinde, ein Ökokonten-Programm durchzuführen bzw. welche Gründe sprechen dagegen, an einem solchen Programm teilzunehmen?
Frage 32	Hätten Sie diese Ausgleichsmaßnahme in jedem Fall durchgeführt, unabhängig vom Ökokonten-Programm, oder hat das Ökokonten-Programm Ihre Entscheidung ausgelöst/ beeinflusst? Erklären Sie bitte Ihre Motivation/Einstellung.
2. THEMENBEREICH: LEISTUNGSFÄHIGKEIT DES ÖKOKONTEN-PROGRAMMS IN BADEN-WÜRTTEMBERG	
2.1 Quantitative Ergebnisse	

Frage 33	Wie viele Gemeinden in Baden-Württemberg haben, Ihrer Meinung nach, bisher Ökokonten eingeführt?
Frage 34	Wie viele Kompensationsmaßnahmen, die ins Kompensationsverzeichnis aufgenommen wurden/ für die Ökopunkte vergeben wurden, wurden bereits durchgeführt?
Frage 35	Wie viele Ökopunkte wurden von Flächenagenturen seit der Einführung des Ökokonten-Programms vergeben? Was würden Sie sagen, welcher finanziellen Summe in € entspricht diese Anzahl von Punkten?
Fragen 36 a-b	a) Auf wie vielen Hektar Land kam es seit der Einführung der Ökokonten zu Eingriffen und auf wie vielen Hektar wurden Kompensationsmaßnahmen durchgeführt? b) Können Sie evt. Angaben zur Anzahl der Flurstücke und deren durchschnittlichen Größe machen?
Frage 37	Hat/Inwiefern hat das Ökokonten-Programm Ihre Ortswahl der Eingriffe beeinflusst (d.h. Haben Sie einen Ort ausgesucht, weil Sie erwarten konnten, dass man dort weniger oder mehr Ökopunkte zahlen muss, um die Eingriffe auszugleichen)?. Denken Sie, dass dieses Programm es möglich macht, Eingriffe auf Land mit einem hohen Biodiversitätswert zu vermeiden und stattdessen auf Land mit einem geringeren Biodiversitätswert durchzuführen?
2.2 Qualitative Ergebnisse	
Frage 38	Inwiefern hat das Ökokonten-Programm die Qualität von Kompensationsmaßnahmen beeinflusst? Kann man von einer Verbesserung oder Verschlechterung sprechen im Vergleich zu traditionellen Ausgleichsmaßnahmen als Eingriffsverursacher noch vor Ort selbst ihre Eingriffe ausgeglichen haben?
Frage 39	Ist das Ökokonten-Programm so flexibel, dass auch Biodiversität mit einem höheren Erhaltungswert geschützt werden kann? <input type="checkbox"/> JA <input type="checkbox"/> NEIN Wenn ja, wie oft fand eine solche Aufwertung bereits statt?
Fragen 40 a-b	a) Wie wird die Additionalität, d.h. ein tatsächlicher Mehrwert einer vorgeschlagenen Maßnahme bewertet und abgesichert, um zu vermeiden, dass Maßnahmen gefördert werden, die in jedem Fall durchgeführt worden wären ? b) Sind in diesem Zusammenhang z.B. Ausgleichsmaßnahmen in Natura 2000 Schutzgebieten (oder anderen Gebieten), in denen es bereits eine Verpflichtung zum Erhalt der Biodiversität gibt, ausgeschlossen?
2.3 Kontrolle/ Monitoring von Ausgleichsmaßnahmen	

Fragen 41	Welche Rolle spielt staatliche Kontrolle im Ökokonten-Programm? Übernimmt der Staat die Kontrollfunktion, um den adäquaten Ausgleich abzusichern, oder sind andere Akteure verantwortlich?
Fragen 42 a-d	<p>a) Wie werden die Auswirkungen der Kompensationsmaßnahmen auf die biologische Artenvielfalt/Biodiversität überwacht?</p> <p>b) Wird darüber Bericht erstattet? <input type="checkbox"/> JA <input type="checkbox"/> NEIN</p> <p>c) Wenn ja, sind diese Bericht zur öffentlichen Einsicht zugänglich?</p> <p>d) Wer ist für diese Kontroll-/Monitoring-Funktion verantwortlich?</p>
2.4 Einstellungen zum Ökokonto	
Fragen 43. 1-6	<p><i>Im Folgenden möchte ich Sie bitten auf einer Skala, die von "ich stimme völlig zu" bis "ich lehne völlig ab" reicht, das Feld an zu kreuzen, das Ihrer Meinung nach den folgenden Aussagen am ehesten entspricht. Begründen Sie bitte Ihre Wahl!</i></p> <p>1. Maßnahmen gegen den Verlust von biologischer Vielfalt werden durch das Ökokonten-Programm effektiv verbessert.</p> <p><input type="checkbox"/> Ich stimme zu <input type="checkbox"/> Ich stimme zu <input type="checkbox"/> teils-teils <input type="checkbox"/> Ich lehne ab <input type="checkbox"/> Ich lehne völlig ab</p> <p><u>Begründung:</u></p> <p>2. Das Ökokonten-Programm ermöglicht einen No-Net-Loss der Biodiversität und zugehöriger Ökosystemdienstleistungen</p> <p><input type="checkbox"/> Ich stimme zu <input type="checkbox"/> Ich stimme zu <input type="checkbox"/> teils-teils <input type="checkbox"/> Ich lehne ab <input type="checkbox"/> Ich lehne völlig ab</p> <p><u>Begründung:</u></p> <p>3. Das Ökokonten-Programm führt zu erweiterten und wiederhergestellten Lebensräumen, in dem es nicht nur das schützt, was schon da war.</p> <p><input type="checkbox"/> Ich stimme zu <input type="checkbox"/> Ich stimme zu <input type="checkbox"/> teils-teils <input type="checkbox"/> Ich lehne ab <input type="checkbox"/> Ich lehne völlig ab</p> <p><u>Begründung:</u></p> <p>4. Die Ausgleichsmaßnahmen des Ökokonten-Programms schaffen ein ökologisches Netzwerk, in dem mehr, größere, bessere und verbundene Gebiete für Biodiversität gefördert werden.</p> <p><input type="checkbox"/> Ich stimme zu <input type="checkbox"/> Ich stimme zu <input type="checkbox"/> teils-teils <input type="checkbox"/> Ich lehne ab <input type="checkbox"/> Ich lehne völlig ab</p> <p><u>Begründung:</u></p> <p>5. Das Ökokonten-Programm wird dem Kriterium der Additionalität gerecht, d.h. es werden keine Maßnahmen gefördert, die in jedem Fall durchgeführt worden wären.</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>

Frage 52 a-b	a) Wie weit ist das Ökokonten-Programm heute verbreitet (gegenüber der erwarteten Entwicklung)? b) Wie schätzen Sie die zukünftige Entwicklung des Programms ein?
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Wenn Sie Kommentare oder Anreize zum Thema haben, können Sie diese hier festhalten.

Kennen Sie noch weitere Ansprechpersonen in Baden-Württemberg oder in Deutschland, die uns bei der Umsetzung des Forschungsprojektes hilfreich sein könnten? Für Hinweise sind wir dankbar.

Wir bedanken uns recht herzlich für Ihre Bereitschaft unseres Forschungsprojekt zu unterstützen und dass Sie sich Zeit genommen haben, unsere Fragen zu beantworten.

Sollten Sie noch Fragen haben, können Sie sich jederzeit gerne an uns wenden.

Ansprechpartner sind Herr Leonardo Mazza (lmazza@ieep.eu) und Frau Julia Schiller (jschiller@ieep.eu), erreichbar im IEEP-Büro in Belgien, Quai au Foin/ Hooikaai 55, 1000 Brüssel, Belgien, Tel: +32 (0) 2738 7482.

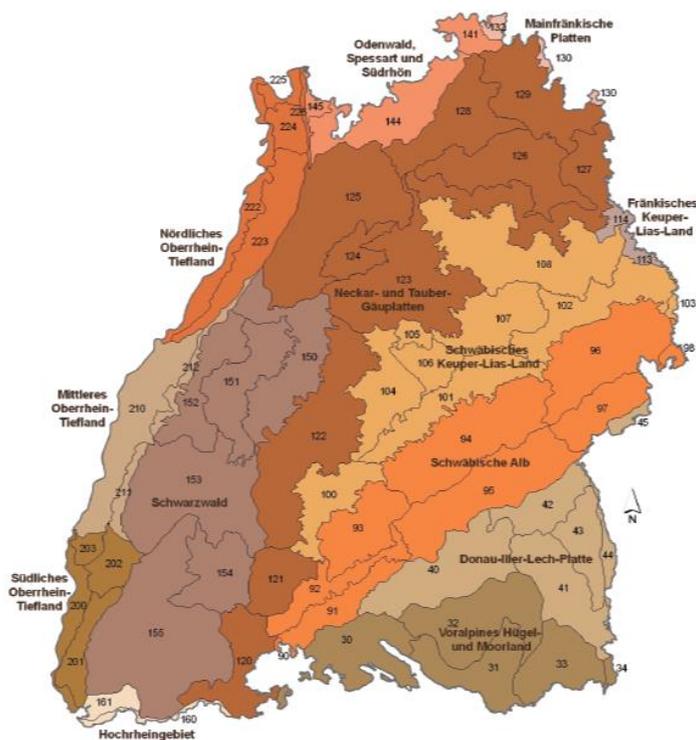
Weiterführende Informationen finden Sie unter: www.ieep.eu; www.biodiversa.org und www.iddri.org.

ANNEX III: NATURAL REGIONS IN GERMANY

Relevant public authorities have divided Germany into “natural regions” (“Naturräumliche Großlandschaften Deutschlands”). The map below corresponds to the division according to the BfN (http://www.bfn.de/0311_image.html [accessed on 10.06.2013])



Natural Region Division of Baden-Württemberg (3. and 4. order according to Meynen/Schmidhüsen et al) (cf. LUBW 2010 (Naturräume BW): p.2)



ANNEX IV: COMPARISON BETWEEN THE ECO-ACCOUNT UNDER THE BUILDING LAW AND THE NATURE CONSERVATION LEGISLATION IN BADEN-WÜRTTEMBERG– AN OVERVIEW

Table 1. Comparative analysis of the two different eco-account schemes co-existing in Baden-Württemberg

	Eco-account under the building law	Eco-account under the nature conservation law
Date of coming into force	1998	2011
Legal basis	<ul style="list-style-type: none"> German Building Code (“Baugesetzbuch”: §135a (2); §200) Federal Nature Conservation Act („Bundesnaturschutzgesetz“) 	<ul style="list-style-type: none"> Federal Nature Conservation Act (“Bundesnaturschutzgesetz”: §13 et seq.) Nature conservation laws on a regional (“Länder”-) level further (NatSchG BW: §22) regional regulation (e.g. ÖKVO BW)
Area of application	<ul style="list-style-type: none"> Building planning (land development plans) and in certain exceptional cases (BauGB: § 34 (4); §18 (1)). 	undeveloped outskirts area (“Außenbereich”) according to § 30 and §35 BauGB and in certain exceptional cases (when development plans replace official planning approvals).
Temporal scope of application (impact-compensation-relation)	<ul style="list-style-type: none"> binding obligation to record anticipated compensation measures binding demonstration of a direct reference to the building planning At the moment of the implementation an anticipated compensation measure does not necessarily be attributed to a concrete residual impact. 	<ul style="list-style-type: none"> No fixed temporal relation between impact and compensation. Latest when the impact takes place, the implementation of compensation measure needs to be started.
Geographical scope of application	<ul style="list-style-type: none"> Municipality/ local subdistricts 	<ul style="list-style-type: none"> Within the same habitat area of 3rd order (“Naturraum”) (according to BNatSchG 2009: §15 (2)).
Administrative level	Municipality (building authority or authority in charge of environment/nature conservation within a municipality) = Local	<ul style="list-style-type: none"> Lower Nature Conservation Authority (district level) and regional = Regional+Local
Geographical and temporal disconnection between compensation and impact	Yes	Yes
Admitted compensation measures that can enter the scheme	Larger scope	Restricted scope
Evaluation model	Every municipality can decide on an own evaluation model. However, the use of the regional standardized evaluation model is recommended in Baden-Württemberg.	Standardized evaluation criteria on a federal state level via the Eco-account Regulation in Baden-Württemberg

Unit	(in most cases) Eco-points	Eco-points
Interest payment	No	Yes (3% during max. 10 years in eco-points, no compounded interests (ÖKVO BW): §5)
Fungibility/tradability of eco-points	Not specified	Yes
Sale of compensation measures	Not specified	Yes
Transparent online registry / Internet tool allowing public insight	No	Yes
Relation between both eco-accounts	<p>Compensation measures under this scheme can be validated under the eco-account under nature conservation legislation under the following conditions (ÖKVO BW: §12 (2)):</p> <ol style="list-style-type: none"> 1) If the compensation measure has neither been credited to an eco-account under the building law nor been attributed to an impact. 2) If the compensation measure was carried out after the 1st April 2011 (coming into force of the ÖKVO BW). 3) A re-evaluation according to evaluation criteria of the eco-account under nature conservation law is necessary (ÖKVO BW: §3) 	Compensation measures under this scheme can not be validated under the eco-account under the building law due to a missing reference to the building planning.

Source: Illustration by JS based on Kratsch 2012: 41; LUBW 2013b

Table 2: Overview of how compensation approaches perform against a selected range of criteria

Comparison of the traditional Impact Mitigation Regulation and the eco-account scheme			
	Classical impact mitigation regulation	Eco-account related to the Building Code	Eco-account related to the Nature Conservation Law
Operationality	Low	Intermediate-high	High
Temporal and geographical decoupling	No	Yes	Yes
Pressure on stakeholders to identify and carry out compensation measure before impacts arises (“Druck des dringenden Bedarfs”)	Yes	No	No
User conflicts	Yes, it increases	No, it decreases	No, it decreases
Participation of parties involved	No, or only partially	Yes	Yes
Sustainable, long-term quality management	No	Yes, but limited experience in practice	Yes (not enough experience)
Establishment of wildlife corridors	No	Limited	Yes
Acceleration of administrative procedures	No	Yes	Yes
Interest Payments	No	No	Yes
IT-tools to increase transparency	No	No	Yes

ANNEX V: INSTITUTIONAL LANDSCAPE – AN OVERVIEW: ACTORS AND THEIR ROLE IN THE GOVERNANCE OF THE ECO-ACCOUNT SCHEMES

Organisation/Actor	German term	Role concerning the IMR/ eco-account scheme
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety	Bundesministerium fuer Umwelt, Naturschutz und Reaktorsicherheit (BMU) ⁴³	Providing the federal legal framework (Federal Nature Conservation Act including the Impact mitigation Regulation)
Federal Agency for Nature Conservation	Bundesamt für Naturschutz (BfN)	The federal ministry's scientific authority in charge of national and international nature conservation ⁴⁴ providing information about the IMR.
Regional Ministry for Environment, Climate and Energy Management/Economics Baden-Württemberg	Ministerium für Umwelt, Klima und Energiewirtschaft Baden-Württemberg ⁴⁵ (UM)	Providing the legal framework on a regional level
Regional authority for Environment, Measurements and Nature Conservation Baden-Württemberg	Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg ⁴⁶ (LUBW)	Equivalent of the BfN on a regional level providing the regional ministry with information. Leading administrative actor in establishing eco-accounts in BW
Regional Ministry for Rural Area and Consumer Protection Baden-Württemberg	Ministerium für Ländlichen Raum und Verbraucherschutz Baden-Württemberg ⁴⁷ (MLR)	In charge of the IMR and Considered as Upper Nature Conservation Authority in BW ⁴⁸
Regional Ministry for Traffic and Infrastructure Baden-Württemberg	Ministerium für Verkehr und Infrastruktur Baden-Württemberg ⁴⁹ (MVI)	In charge of the IMR in relation to road construction
Regional Commission/Council/Board	Regierungspräsidium (Stuttgart, Freiburg, Karlsruhe, Tübingen)	Middle Nature Conservation administrative level in BW
Lower Nature Conservation Authority/Office	Untere Naturschutzbehörde (UNB)	In charge of implementing, controlling, monitoring, evaluating the IMR and eco-accounts under Nature Conservation Law on a district level in BW
Municipality	Gemeinde	Can be considered as compensation agent and as a developer. Represents the operational level of the Building Law eco-account (implementation, controlling etc.) and major actor providing land to carry out

⁴³ <http://www.bmu.de/>

⁴⁴ Bundesamt für Naturschutz 2013: „Über das BfN“. In: http://www.bfn.de/01_wir_ueber_uns.html [accessed on 09.06.2013]

⁴⁵ <http://www.um.baden-wuerttemberg.de/servlet/is/101780/>

⁴⁶ <http://www.lubw.baden-wuerttemberg.de/servlet/is/35855/>

⁴⁷ <http://www.mlr.baden-wuerttemberg.de/>

⁴⁸ http://www.mlr.baden-wuerttemberg.de/Naturschutzverwaltung_Wer_macht_was/99717.html

⁴⁹ <http://www.mvi.baden-wuerttemberg.de/servlet/is/108981/>

		compensation measures for both eco-accounts.
Compensation Agency	Flächenagentur	Private agencies providing service packages around the eco-account scheme to facilitate the management of all administrative steps/procedures for private investors (both compensation agents and developers)
Compensation agent	Maßnahmenträger	Private actor or a municipality that want to carry out anticipated compensation measures with/without being obliged to do so
Developer	Eingriffsverursacher	Private actor or a municipality responsible for an impact and obliged to compensate
Local association	Regionalverband	Local corporate body/ authority in charge of landscape planning (CAN BE!), identification of land etc.
Interest Groups/ NGOs	Interessengruppen/NROs	Involved in the eco-account scheme on different levels (implementation, communication, monitoring, lobbying)
Nature Conservation Foundations	Naturschutzstiftungen	Institutions on a regional level (CAN BE) providing land, managing funds provided via compensatory payments for Nature Conservation purposes.
Planning office	Planungsbüro	Intermediate actor between client (compensation agent or/and developer) and the Lower Nature Conservation office) providing technical expertise in identifying, evaluating, negotiating and monitoring compensation measures (planning/implementation)
Farmers	Landwirte	Important category of private actors playing a major role as land-owners and potential compensation agents. Are excluded from developer side due to §14 (2) BNatSchG 2009. Appear at the end of the implementation chain of eco-accounts as fundamental actors carrying out compensation measures (e.g. as stockman).

ANNEX VI: EXAMPLE OF A MUNICIPAL EVALUATION MODEL TO ASSESS RESIDUAL IMPACTS AND COMPENSATION MEASURES: BACKGROUND INFORMATION RELATING TO THE EVALUATION PROCEDURE OF THE DISTRICT “SCHWARZWALD-BAAR-KREIS”

At the beginning of the 1990s, the legal transition period between the adoption of the amendments in the Building Code and a sufficient operability to implement eco-accounts under the building law led to actors on the municipal level developing their own evaluation models. The creation of a simple, operational, 10-level habitat-hectare evaluation model based on works published by Reck/Kaule in 1994 was proposed by a small group of local actors including representatives from the municipal level. The evaluation model focuses mainly on the assessment of habitats and soil. Bonus points can be attributed to measures relating to the following assets: water, soil (construction methods) species and climate. This can only be done if the compensation agent or developer respects (non-legally binding) environmental standards in an exemplary manner. Similarly to the LUBW evaluation model, points are attributed to every sub-category of habitat types and multiplied by the surface in hectare. Finally, a nominal-actual value comparison provides the information about the necessary value in eco-points of the compensation measure.

Interviewed developers of this evaluation model criticized especially the “pseudo-exactness” of mathematically and technically complex evaluation models on a theoretical level, but which do not provide a high level of operability. Since the introduction of the eco-account under nature conservation law and its regional recommended evaluation model, municipalities using their own evaluation model are confronted with the necessity to potentially convert their calculations into the regionally recommended one. Therefore, representatives from the municipal level underline the importance of homogenizing the co-existing evaluation models to ensure the compatibility between different evaluation approaches.

The following extract of the first section of the evaluation form relating to the asset “biotope/habitats”, to be filled out for every development project, illustrates the assessments as follows: The **green** part on the left hand side provides the information about the different sub-categories of habitats to be assessed. The actual value is to be filled in the **red** column and the nominal value in the **blue** column. Points attributed per hectare are indicated in **orange** and can be evaluated with an addition/reduction margin of 20%. After having evaluated all sections (the soil and bonus sections) a final balance is drawn determining the number of points attributed to a compensation/ residual impact (All information are based on personal communication, municipality of Villingen-Schwenningen: Mrs. Siegel and Mr. Schott; municipality of Donaueschingen: Mr. Dr. Bronner).

I. Biotischer Teil (Schutzgut: Biotope)

assessment of the actual value

assessment of the nominal value

Flächenkategorie habitat types/ sub-categories	Punkte (0->100) points per ha	Bestand Ist - Zustand : Baugebiet und Ausgleichsflächen			Planung Soll/End - Zustand : Baugebiet und Ausgleichsflächen				
		Fläche (in ha) surface in ha	Zu/Abschlag (max. 20%)* addition on reduction of 20% is possible	Begründung	Punkte gesamt	Fläche (in ha)	Zu/Abschlag (max. 20%)*	Begründung	Punkte gesamt
1. Grünland - nicht § 32 NatSchG									
1.1 Mähweide, Fettwiese (Silage- oder Weidenutzung)	40				0,0				0,0
1.2 Heuwiese (früh genutzt)	50				0,0				0,0
1.3 Feuchtwiese	60				0,0				0,0
1.4 Hochstaudenflur	60				0,0				0,0
1.5 Magerrasen/ -weide	70				0,0				0,0
2. Acker									
2.1 Maisanbau	20				0,0				0,0
2.2 Konventionell	30				0,0				0,0
2.3 Ökologischer Landbau	50				0,0				0,0
3. Wald - nicht § 32 NatSchG bzw. § 30a LWaldG									
3.1 Monokultur	40				0,0				0,0
3.2 Mischwald	60				0,0				0,0

III. Gesamtbilanz

Ergebnis nach I: 0	Ergebnis nach II: 0	Ergebnis nach III: 0
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Bilanz:	0,0
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