Implementing ecological networks through the Red for Green approach in a densely populated country: Does it work?

V. Simeonova^{1,2} · E. Achterberg¹ · E. A. van der Grift²

Received: 28 May 2016 / Accepted: 13 September 2017 / Published online: 20 September 2017
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Abstract Regional and local governments in Europe are often challenged with establishing suitable institutional practices to meet ecological targets within urban spatial development plans and address the ultimate goal of the Environmental Policy Integration (EPI). EPI has been proliferated by the European policy as the operational principle to sustainable development. Yet it is necessary to develop and apply suitable approaches that allow achieving EPI within the policy implementation practices of the local and regional authorities. Particularly in the field of urban planning, such EPI approaches are needed to more firmly integrate ecological considerations in the land-use planning process and safeguard the sustainability of urban developments. This is the case when implementing key nature policy objectives such as the development of national ecological networks (NEN) aimed at protecting biodiversity, and in which multiple actors and sectorial interests are involved. Among European countries, the Netherlands has been a forerunner in NEN development and has applied innovative approaches such as the Red for Green approach (RGA). The RGA aims to integrate ecological issues (green) in urban developments (red) and establishes a communicative platform for the actors involved in the urban developments. This study assesses the unique experiences with the RGA in seven regional case studies, identifies its key success factors and reflects on its role as a communicative practice towards EPI. The study concludes that the RGA can be a suitable approach to integrating ecological network objectives in urban developments. However, RGA's success depends on five factors, among which the two most important are the actors' communication and development of a shared strategic vision on developments.

Keywords Environmental policy integration · Ecological networks · Nature conservation policy · Urban development · Communicative planning

✉ V. Simeonova
vanya.simeonova@wur.nl

¹ Land Use Planning Chair, Environmental Science Group, Wageningen University, P.O. Box 47, 6700 AA Wageningen, The Netherlands

² Wageningen Environmental Research, P.O. Box 47, 6700 AA Wageningen, The Netherlands

1 Introduction

Urbanization has a significant impact on the natural environment and often results in degradation and fragmentation of natural habitats (Foley et al. 2005; United Nations Habitat 2012; Coutard et al. 2014). While more than half of the world's population now lives in urban areas, studies have shown that as population density increases so does the threat to biodiversity (Luck 2007). In an attempt to reduce such impacts, an integrated perspective in land-use planning is recommended by variety of scholars in the field of planning and biodiversity conservation. Such a perspective aims to envision mutual benefits between economic developments and nature conservation goals. As argued by planning scholars, such mutual benefits can be ensured only if decisions regarding land-use transformations of natural landscapes into urbanized areas are based on knowledge about the impact of these transformations on natural habitats (Theobald et al. 2000; Berkes et al. 2003; Opdam et al. 2002; Termorshuizen et al. 2007). Moreover, practices have shown that, even if available, ecological knowledge is often not shared among planners or decision makers during the planning process (Mcelfish and Kihlsinger 2009). In this regard, improvement in these traditional planning practices has been considered necessary to address the increasing societal needs in urban development and the competing claims for land uses by different sectors, including for green areas and nature (Berkes et al. 2003; Termorshuizen et al. 2007; Shandas et al. 2008; Beatley 2010; CEC 2013). Such transformation, as justified by planning scholars, would ideally focus on involving multiple stakeholders such as planning authorities, private actors or local communities in order to resolve differences in interests in a collaborative manner (Innes and Booher 2003; Healey 2006; Nadin and Stead 2008).

These issues have become particularly evident in the implementation of nature conservation policies in many countries in Europe in which the spatial planning systems play a crucial role (Dale et al. 2000; Daniels and Lapping 2005; Simeonova and van der Valk 2016). The emergent need for integration of ecological objectives in spatial plans has been as well acknowledged within European policy frameworks on territorial development and biodiversity conservation (EEA 2006a, b; CEC 2011a). The underlying policy process for this integration is based on the Environmental Policy Integration (EPI) principle (Jordan and Lenschow 2010). EPI is defined as “the incorporation of the environmental objectives into all stages of policy-making in non-environmental policy sectors, with a specific recognition of its role as a guiding principle for the planning and execution of policy” (Lafferty and Hovden 2003). EPI implies the consideration of environmental consequences of sectoral policy activities that promote economic development. EPI is viewed as a process and an outcome to be anchored in the institutional frameworks of different policy sectors with the aim of achieving more sustainable developments. The establishment of an EPI process, however, is rather challenging, and it depends on the changing administrative cultures of different governmental authorities responsible for policy development and implementation. The key challenges to EPI as described in the literature relate to the organizational fragmentation and lack of collaboration between governmental scales and sectoral departments responsible for different policies (Jordan and Lenschow 2010; Mulally and Dunphy 2015). Until now, few analytical reviews have provided much on the way of explanation of the process or an indication of possible means towards EPI in different policy sectors and in the field of planning (Lafferty and Hovden 2003; Persson 2004; Simeonova and van der Valk 2009; Jordan and Lenschow 2010). However, systematic knowledge on how to address EPI, in different policy sectors (e.g. urban development, energy, agriculture, transport etc.) and across different governmental scales, is still being

developed (Mullally and Dunphy 2015). EPI is often interpreted as a form of policy integration based on multilevel governance (vertically: across scales and horizontally: across sectors) (Lafferty and Hovden 2003; Jordan and Lenschow 2010).

While the general policy integration concept has long been a part of the scientific debate on planning theory, the role of the EPI principle has attracted the attention of planning scholars more recently (Simeonova and van der Valk 2009; Stead and Meijers 2009; Scholz et al. 2012; Stight et al. 2013). In the field of planning, EPI is interpreted as an incremental form of planning which encourages long-term strategic visions about spatial development of a territory, brings together variety of policy interests, supports sustainable development and improves collaboration between stakeholders (CEC 1999; Eggenberger and Partidário 2000; Healey 2006).

While there is no consistent framework of approaches for implementing EPI in various policy contexts and governance levels, studies have identified a number of key approaches including strategic, procedural, structural, coordinative and communicative approaches (Hertin and Berkhout 2003; Simeonova and van der Valk 2009; Mullally and Dunphy 2015). The strategic, procedural and structural approaches focus on the substantive elements of the EPI process, such as elaborating an overarching EPI strategy, establishing coordinating structures and legal procedures, and the communicative approach aims to address actors' communication processes at inter-organizational level (Hertin and Berkhout 2001; Von Homeyer 2006; Jordan and Schout 2007). Among these approaches, of particular interest among policy makers and planning scholars has been the communicative approach (Healey 2003; Simeonova and van der Valk 2009; Runhaar et al. 2014). This approach is advocated as a way of providing more efficient communication between a variety of actors across policy sectors in order to balance different interests (Margerum 2002; Healey 2003; Innes and Booher 2010). Such an approach offers a platform for actors to share their interests and competences so that preventing environmental impacts of urban developments is a shared responsibility and not just that of one institution or department (Innes and Booher 2010). This necessitates suitable institutional arrangements and organizational structures to facilitate collaboration, communication and exchange of knowledge (EEA 2005; Von Homeyer 2006; Simeonova and van der Valk 2009; Runhaar et al. 2014). This article explores some of these institutional arrangements in the actual planning processes.

Up to now, only few prominent planning practices have been developed that apply EPI in urban planning (EEA 2006b; Simeonova and van der Valk 2010; Nadin and Stead 2012). For example, a number of initiatives in the Netherlands, Denmark, Sweden and the UK have led to the development of integrated spatial planning strategies based on a multilevel collaborative process between governmental agencies. Some of these strategies have been developed as part of the compliance process with the EU nature policy and legislation. The EU nature policy, which aims at conservation of wild flora and fauna, embeds the need for EPI in urban spatial plans as a key prerequisite to preserving and restoring natural habitats in close proximity to urbanized areas or within cities (Miller and Hobbs 2002; Opdam et al. 2003; CEC 2013). This implies the formation of spatially coherent ecological networks of protected areas that interlink natural habitats fragmented by urbanization and provide sufficient habitat to facilitate viable populations of flora and fauna (Jongman 1995; Opdam et al. 2003; Jongman et al. 2004). This idea is envisioned in the Pan European Ecological Network (Jongman et al. 2011). In addition, the Habitats and Bird Directives envision the designation and management of a network of protected areas such as Natura 2000 (Council Directive 92/43/EEC 1992; CEC 2011b). One of the main challenges in the development of such ecological networks is achieving the needed landscape configuration and spatial

cohesion between the protected areas (Opdam et al. 2003; Jongman et al. 2004). This challenge is aggravated particularly in densely populated areas where pressure from urban land-use developments is high. Moreover, in many countries, the institutional arrangements to implement the ecological network strategy are not explicit regarding the responsibilities and competences of different governmental agencies and stakeholders with regard to ensuring proper nature conservation in spatial plans (Termorshuizen et al. 2007; Shandas et al. 2008; Termorshuizen and Opdam 2009; Beunen and Duineveld 2010; Beatley 2010).

Several member states, including the Netherlands, Germany, Poland and Spain, have developed national policy plans for ecological networks (NENs) (Jongman and Kristiansen 2001, Jongman et al. 2004). Among these, the Netherlands has been one of the forerunners, where the NEN was developed shortly before the introduction of the EU Natura 2000 policy (VROM 2004). In line with the EPI principle, the NEN became an integral part of the Dutch national spatial development strategy and has been considered in the plans of the regional and local governments (VROM 2004; LNV & VROM 2009a).

In this article, we explore in more detail the unique experiences generated with the implementation of the EPI principle in integrated spatial development practices in the Netherlands, related to the realization of the NEN. The focus is particularly on assessing the role of a distinctive planning approach such as the Red for Green approach (RGA), which emerged during the implementation of the Dutch NEN. RGA has fostered the integration of nature conservation objectives in spatial developments at regional scale and has been applied by several regional and local authorities (van Rij 2008; Wolff and Spaans 2010). The key objective of the research is to assess whether approaches such as RGA are examples of EPI in urban spatial development. The key questions asked are in what way RGA can be a beneficial approach for integrating nature conservation objectives in urban spatial plans and whether it offers useful mechanisms for collaboration between various actors during the planning process. Finally, we identify key success factors of RGA and explore how these success factors can help to address EPI in urban planning.

2 Research methods

2.1 General approach

This research is based on qualitative methods of data collection and analysis, namely an in-depth case study and a comparative case study analysis (Creswell 2007). These methods were considered as most suitable for assessing the specific institutional context of the planning practices of RGA, which has been used in different projects and by different regional authorities across the Netherlands. The case study analysis allowed specific observations to be made on the underlying process of the RGA and on its applicability in different local contexts and actors' involvement (e.g. public and private). It also made it possible, via interviews, to gain insight into the experiences and perceptions of different actors who were involved in the RGA projects. In the case study analysis, the RGA was referred to as a potentially beneficial approach to EPI that can improve institutional cooperation in urban development and nature conservation projects and can facilitate actors' collaboration. With this in view, we assessed the institutional challenges in implementing the RGA projects as a form of EPI. The assessment addressed four key aspects of EPI, which were identified in previous studies, including: (1) formulation of

planning objectives and development of a strategic vision; (2) shared responsibilities between actors; (3) planning procedures; and (4) communicative process between actors (Jacob et al. 2008; Stead and Meijers 2009; Simeonova and van der Valk 2009).

2.2 Selection of cases, data collection and analysis

In order to select the most suitable cases for analysis, we first compiled a long list of 45 projects in which the RGA was used. These projects were described based on available data about their status and implementation. We selected seven case studies from this long list for an in-depth case study analysis (see Appendix 1; Fig. 1). The selected projects all started between the years 2001 and 2006. Projects that started more recently were excluded because the implementation phase had not yet been reached, so it would not have been possible to assess their outcomes. The selection of the seven projects was made on the basis of the following criteria: (1) the project uses the RGA at the regional scale; (2) the project addresses *green* ambitions that are significant for developing the ecological network; and (3) the project involves multiple public and private actors. Appendix 1 provides an overview of the selected case studies, including their aim, *red* and *green* ambitions, and involved actors. All case studies consisted of spatial development plans in suburban areas where *red* and *green* functions usually compete for the same space (Fig. 1). Data on each selected case study were gathered by reviewing relevant documents in which the project was described and by interviewing key actors. The selection of the documents to review was done on the basis of whether they contained primary data about the developmental vision and the design of the project area. Documents selected included the spatial plans, progress reports, collaboration agreements, environmental impact assessment reports, consultation reports and governmental policy plans addressing the development of the NEN in the case areas).

Fig. 1 Map of the Dutch National Ecological Network, 2015, with location of the RGA case studies (adapted from http://www.clo.nl/sites/default/files/infographics/1425_001k_clo_02_nl.png)

In total, 23 actors were interviewed. The criteria for selecting the respondents were (1) that they were directly or indirectly involved in the projects; (2) their interests were to one degree or another affected by the developments of the RGA; and (3) they were willing to openly share information or their opinions. Following Creswell's method of qualitative research (2007), we assessed in advance who might be appropriate candidates for the interviews (Creswell 2007). The respondents consisted of ten representatives of public authorities (policy makers and project managers from national, regional or local government), four representatives from non-governmental organizations (groups that endorse nature conservation), four representatives from private organizations and developers' associations, and five representatives from universities (mostly experts in the field of spatial planning and ecological network development) (see Appendix 2).

The interviews were semi-structured and open-ended, and all interviewees were asked the same questions. We chose this type of interview, as it facilitates faster responses that can be easily analysed and compared. The interviews lasted approximately 60 min and were taped and transcribed. The questions aimed to solicit information about: (1) project status and progress; (2) interviewees' roles and responsibilities within the project; (3) the project elements in which the RGA was used; (4) interviewees' opinions on the RGA's effectiveness; (5) their opinions on whether or not the RGA improved the communication processes between policy makers, planners, NGOs, researchers and private actors; and (6) perceived success and/or failure factors for RGA. The interviewees were also encouraged to mention any other issues they deemed important in terms of significantly affecting project implementation and outcomes. Appendix 3 provides an overview of the open-ended questions that formed the framework for each interview. Furthermore, we used a stepwise approach to analyse and compare the case studies. In the first step, we reviewed each case study individually and conducted an in-depth analysis of the data. We analysed whether the RGA was a suitable or promising approach to EPI for developing or restoring ecological networks at the regional level in each case. We also identified each case's success and/or failure factors for the use of the RGA. The success factors were formulated as factors that supported progress in the NEN development and achieved beneficial outcomes in favour of the "green" ambitions indicated by each project. This we refer to as the achievement of EPI. The formulation of the relevance of the success factors is based on qualitative assessment of respondents' statements. The number of positive responses regarding the importance of each success factor was assessed and then schematized based on arbitrary approximation. Finally, we used the results of the in-depth analyses of each individual case in a comparative analysis across all case studies. We identified similarities and differences between the case studies with respect to the applicability of the RGA and assessed which key success factors are generic factors that determine whether or not the RGA will succeed. Based on these success factors, we assessed whether RGA might be a beneficial approach with a view to supporting the communicative process between actors towards the achievement of the EPI in urban planning.

3 Research findings

3.1 The policy context of the Dutch NEN and the Red for Green approach

The Dutch NEN was introduced in 1990 with the aim of obtaining 728 500 hectares (18% of the Netherlands) of linked nature areas by 2018 (Ministry of Agriculture, Nature and

Food Quality-LNV 1990). Since its introduction, the NEN has become a leading concept in Dutch nature policy and is seen as representing a shift from poor preservation strategy for nature to an integrated spatial planning approach to the development of nature (Hootsmans and Kampf 2004). The protection of nature areas with low dynamics against highly dynamic functions such as agriculture and urbanization has become an integral trend within the NEN. While the planned targets are still in the process of being realized, a number of issues have emerged as the NEN develops. Among these are the achievement of balanced land uses, land acquisition and habitat restoration, which are currently behind schedule (CBS et al. 2014). The midterm evaluation of the NEN development indicated that more efforts and rapid actions are needed to resolve these issues, in order to ensure sufficient spatial cohesion of the NEN and that the European biodiversity targets are fully met (CBS et al. 2014). As a key element of the NEN, planning of the ecological corridors that are needed to ensure spatial coherence and link habitat patches for the purpose of the NEN appeared to be particularly challenging for many local and regional authorities (LNV 2008; LNV & VROM 2009a). The key challenges are related to the ecological requirements that need to be embedded in the urban land-use plans and which affect a large number of public and private interests (LNV & VROM 2009a, b).

The Red for Green Approach (RGA) was developed in the late 1990s as one way of dealing with these emerging issues in the development of the NEN (Wolff and Spaans 2010). It evolved from discussions among policy makers about increased competition for land within and around urban areas, which was creating conflicts often described as “the battle between red and green”. The primary goal of the RGA is to integrate ecological objectives in planning by extending, improving or compensating for possible loss of *green* land-use functions (e.g. nature areas) by using the profits from development of *red* land-use functions (e.g. housing) (Evers et al. 2003; Milieu en Natuur Planbureau 2005). The role of the RGA is to ensure that regional and local authorities communicate their plans with various public and private actors, while being involved in a bargaining process about balancing *red* (urban) and *green* (ecological) functions (Evers et al. 2003; VROM 2004; Wolff and Spaans 2010). The Dutch Bureau for the Environment and Nature states that the RGA stands for: “an integrated development of red and green, where the development of green is financed by the development of urban infrastructure” (MNP 2005). Evers et al. (2003) refer to RGA as a *cross-subsidizing process* or as the way to “generate improvements for nature by utilizing the incomes from urban developments”.

Although the RGA is mostly applied voluntarily in both regional and local planning processes, the national government has also supported this approach (VROM 2004; LNV & VROM 2006, 2009b). It has also expressed expectations that private parties contribute financially to developing and maintaining ecological areas from property development profits (LNV & VROM 2006). The RGA has consequently developed as a collaborative planning practice which breaks with conventional hierarchical planning procedures and involves new networks of actors in the planning process. It implies that governmental authorities will actively seek collaboration with real estate developers and other parties to improve the quality of spatial developments, preserve nature and increase the speed at which ecological projects are implemented (van Rij 2008). Although regional authorities that have applied RGA have found it appealing because of promising preliminary experiences, the key challenges and the effectiveness of the RGA have not yet been well studied (Wolff and Spaans 2009).

3.2 Implementing the Dutch NEN with the Red for Green approach

With the NEN becoming a statutory obligation in the spatial planning process of the Dutch provinces, based on the national spatial policy plan “Nota Ruimte” (2004) and the national structural scheme “Green Space” (SGR, LNV & VROM 1993; VROM 2004), responsibility was given to the regional authorities for planning nature conservation functions within their regional and municipal spatial plans. The conservation regime of the NEN as embedded in the national policy documents is directed towards the maintenance, restoration and development of the areas that are part of the network. This process also requires that a balance be achieved with other interests in the spatial development in and around the NEN areas. This includes designing measures where nature compensation might be needed for spatial developments and urbanization. To address these issues, a joint agreement was endorsed between the national and regional authorities in the so-called Decentralization impulse agreement (LNV 2008; LNV & VROM 2008). Under this agreement, the national government retained the leading role in terms of setting key nature policy objectives and targets of the NEN realization, while the regional authorities were given the jurisdiction to decide on the possible planning arrangements and instruments to realize these targets and implement NEN regionally.

While there is no generally accepted framework of planning instruments for implementing the NEN, there are three distinctive categories of planning instruments which have so far served as the basis for the realization of the NEN, namely *procedural*, *strategic* and *collaborative*.

The *procedural* planning instruments are embedded in the legal provisions of the national spatial plan and accompanying policy agreements (VROM 2007). Therefore, strict conditions apply for using these instruments. The key restriction is to prevent or limit urban developments taking place within the established borders of the NEN unless the proposed development serves an overriding public interest or there are no alternatives (LNV 2008; LNV & VROM 2009a, b). The key regulative principle promoted is the “no, unless regime”. Spatial development plans and projects that may affect the quality of NEN are strictly assessed according to this rule. The most commonly used procedural instruments used to achieve the regulative restrictions in urban developments as shown by the RGA projects relate to the regulation and financing of the land uses for the purpose of the NEN, including *amicable land acquisition*, *land expropriation* and *financial compensation*.

The *strategic* instruments are related to the decision-making of the NEN development during the regional spatial planning process. While complying with the “no, unless regime”, regional governments are striving to enhance the vitality and the sustainability of their regions through a variety of spatial developments which may conflict with the NEN, but also have the potential to create opportunities for enhancing its quality. For this reason, the national spatial plan offers a number of strategic options that refer to more integrated spatial development and tailor-made planning solutions. The Dutch government chose in this case for a less rigid, but more strategically oriented spatial planning policy. The strategic instruments set specific conditions under which developments can take place within the NEN and where RGA-related arrangements can be made. For example, within the RGA projects, urban developments were made possible on condition that the NEN maintains its current extent and value, but also that its overall quality is improved. In this strategic process, urban development projects in proximity to or within the borders of the NEN are first strictly assessed with regard to “overriding public interests” and consequently are qualified for being implemented via one of the following three strategic

instruments: *compensation, boundary redrawing or the balancing approach* (LNV & VROM 2009b). The first instrument, with the motto “first mitigate then compensate”, safeguards the compensation for loss of natural areas or qualities due to specific urban development by introducing mitigation and habitat restoration measures from the start of the project. If mitigation is either not possible or not sufficient in a particular case, then compensation for the loss of nature should be provided in an alternative location (i.e. no-net-loss principle). The second instrument, *boundary redrawing*, is used when land-use changes related to urban developments are relatively small and there are sufficient possibilities for mitigation and restoration measures at the project site itself. This instrument allows provinces to make minor adjustments to the NEN boundaries for ecological reasons as well as for insignificant urban developments. The conditions for this are that any damage to nature is limited and that the boundary adjustment improves the overall quality of the NEN.

The *balancing approach* allows limited urban land-use developments within the NEN, on condition that a cluster of projects is involved and these projects are incorporated in one comprehensive regional plan. The objective of the regional plan is to improve the overall quality of the ecological network. The proposed land-use changes in these projects concern relatively larger areas and occur at different locations, and the effects on nature can only be compensated for through a series of planning measures occurring at different locations. This way a project should ensure that the ecological network will grow both in size and quality, balancing the urban and ecological functions in the entire area under development. The ambition in these projects goes beyond the no-net-loss principle, as most environmental stakeholders demand that nature areas undergo improvement compared to the situation before the start of the project. This strategy is often referred to as the basis for the RGA initiatives (LNV & VROM 2008).

The most common *collaborative planning instruments* are *public party land-exploitation partnerships, public-private land-exploitation partnership, and private party land-exploitation partnerships*. These instruments are based on agreements between public and/or private actors. These are achieved by early planning-stage negotiations in which actors define the content of the project, investigate possibilities and risks, and negotiate the distribution of costs, benefits, risks and responsibilities (Koppejan 2005). There is often a great need for one or more of these instruments, as most projects that use the RGA type of planning involve multiple actors with significant differences in ambitions and interests. The agreements play a key role in creating a solid basis for an even playing field for negotiations between all actors. However, implementation of these agreements implies intensive communication and consensus building throughout the project's planning process.

Our research shows that in each of the assessed RGA case studies, different planning instruments (or combinations of planning instruments) were used (Table 1). Obviously, there is no universal combination of planning instruments, as projects, ambitions, actors and restraints may differ considerably. On average, four to five different planning instruments were used in each case study. The most commonly used planning instruments were: (1) from the procedural instruments the *amicable land acquisition* (all seven cases); (2) from the strategic instruments the *balancing approach* (all seven cases) and (3) from the collaborative instruments the *public-public* (four cases) and *public-private partnerships* (four cases). Land expropriation and private party partnerships were the least-used instruments (each was used in one of the cases).

Table 1 Planning instruments used in the selected case studies

Type of instrument	Planning instrument	C1	C2	C3	C4	C5	C6	C7
Procedural	Amicable land acquisition	+	+	+	+	+	+	+
	Land expropriation		+					
	Financial compensation			+	+			
Strategic	Compensation for nature			+			+	+
	Boundary redrawing	+			+	+		
	Balancing approach	+	+	+	+	+	+	+
Collaborative	Public party partnership				+	+	+	+
	Public–private partnership	+	+	+			+	
	Private party partnership		+					

3.3 To what extent do RGA projects address NEN ambitions?

Table 2 provides an overview of the current project status of each case study and the ecological ambitions that have been reached so far in relation to the realization of the NEN. As most projects are still in the process of realization or in their finalization phase, a final conclusion of the degree to which the NEN ambitions were met cannot yet be drawn. However, the results suggest that all initially formulated ecological ambitions will likely be met in at least five of the projects.

Our assessment showed that there were differences in the time of realization between the different projects and that some projects experienced significant delays. The reasons for this are that the realization of the RGA projects can be influenced by unexpected budget restraints due to sudden changes in the national land and housing markets. In this case, three of the projects required readjustment of the subsidizing strategies and a partial reformulation of the initial ambitions regarding NEN developments. This led to down-sizing both the urban development (housing) and the ecological developments that will be realized by the end of project. In addition, one of the projects was discontinued due to major financial constraints that could not be resolved. Furthermore, in all RGA projects the initial phases can be characterized as involving a time-consuming process due to the need for negotiations between all actors.

The general observation, however, seems to be that, from the *green* achievements made in the RGA projects, the NEN ambitions have not been overlooked because of urban developments, but on the contrary have as much as possible followed the initial ambitions set at the beginning of the projects. This marks the potential role of RGA to safeguard *green* interests where NEN is not quickly ignored, but is a key objective of the area development.

3.4 Key success factors of the RGA planning

The RGA projects assessed in this study referred to RGA as a feasible option for the development of NEN. The key argument for this is that RGA planning contributes to the design of tailor-made solutions for improving the overall quality of the NEN areas and for restoring ecological corridors across these areas that are crucial for its spatial coherence. Several interviewees said that the RGA made it possible to establish vital parts of the

Table 2 Status of the RGA projects with regard to NEN ambitions

Case study project	Project status	Timing	Red ambitions	NEN ambitions
1. <i>Meerstad</i>	Ongoing	Delay	Downscaling in housing developments	Ecological ambitions in process of realization. The initial area for the NEN development has been downsized by 6%. The ecological corridor is in development
2. <i>De Blauwe Stad</i>	Ongoing	Delay	Downscaling of the housing developments	Ecological ambitions realized
3. <i>Hart van de Heuvelrug</i>	Ongoing successful implementation with additional risk prevention measures taken regarding financial constraints on the housing market	According to plan	Not changed	Ecological ambitions in final phase of realization. Five wildlife overpasses developed and two ecological corridors
4. <i>Wieringerrandmeer</i>	Discontinued	—	—	—
5. <i>Marickenland</i>	Ongoing realization, new arrangements in the plan were made in 2015 regarding the recreational zones	According to plan	In process of realization	Ecological ambitions in process of realization. An ecological corridor is being developed
6. <i>Zoetermeer Zuidplas</i>	Ongoing implementation with adjustments due to financial constraints	According to plan	Downscaling of the initial ecological ambitions	The initial number of planned ecological corridors has been decreased
7. <i>Park Lingezegen</i>	Ongoing successful implementation	According to plan	Not changed	Ecological ambitions in final realization phase. Ecological corridor developed

network. One interviewee stated: “RGA made it possible to fill in some ‘missing links’ in our ecological network”. In order to gain a better understanding of the way RGA may or may not work for the NEN, we have assessed its key success factors based on the experiences generated within case study projects.

Among the stated success factors, we identified five key success factors (mentioned by at least five interviewees) which were considered vital for the effective use of the RGA. These include: (1) jointly developed strategic vision; (2) communication between actors; (3) shared responsibilities; (4) economic incentives; and (5) efficient land-use planning procedures (Fig. 1). The degree of recognition of the key success factors differed between interviewees and cases (Table 3). Table 3 shows that at least four key success factors were identified in each case. In cases 1–5, the importance of all key success factors was recognized, although not by all interviewees. The next section describes each success factor and why interviewees perceived them as important for a successful RGA.

Table 3 Key success factors perceived by the interviewees

Success factor	Case 1 <i>N</i> = 4	Case 2 <i>N</i> = 2	Case 3 <i>N</i> = 6	Case 4 <i>N</i> = 3	Case 5 <i>N</i> = 2	Case 6 <i>N</i> = 3	Case 7 <i>N</i> = 2
Jointly developed strategic vision	●●○○	●●	●●●○○○	●●○	●●	●●●	●●
Communication between actors	●●○○	●●	●●●○○○	●●●	●●	●●●	●●
Shared responsibilities	●○○○	●○	●●○○○○	●●○	●○	●○○	●○
Economic incentives	●○○○	●●	●●○○○○	●○○	●●	●●○	○○
Efficient land-use planning procedures	●○○○	●●	●●○○○○	●○○	●○	○○○	●○

N indicates the number of interviewees. Each dark circle represents the recognition of the success factor by one interviewee. Open circles represent interviewees that did not mention the success factor

3.4.1 Jointly developed strategic vision

One key success factor was the development of a strategic vision on the spatial plans in which urban functions and NEN improvements would be integrated and in which all actors participated. The development of such a vision proved to be an essential first step to agreeing on the goals and ambitions of the proposed spatial development and in providing the argument for using the RGA. An agreed-upon vision on how the NEN objectives will be achieved within the spatial plan and how specific land-use developments will be balanced offers a platform for all actors to share interests. It also gives public authorities the opportunity to deliberate with private parties in an early stage of the planning process on how to intertwine conflicting land-use functions and how to provide the resources needed for the intended NEN improvements. Most of the planners interviewed claimed that such a vision is important for assessing the degree of compliance with the national policy objectives on NEN, in order to provide a bird's eye view of the authorities' aims in the long run. As stated by one interviewee: "If the public party does not have a good vision of what their ambitions are, the project developers can use this fuzziness for meeting only their own interests".

The strategic vision should not only address ambitions and possible developments, but also the preconditions and procedures under which the RGA will operate (Zandee and Tiemersma 2009). Most interviewees who mentioned such a vision as an RGA success factor believed that its success was mostly due to the fact that it initiated dialogue between and inclusive engagement by all stakeholders early in the planning process. In half of the case studies, this factor ensured an early formal involvement of the key public and private actors and prevented the planning process from being dominated by any particular vested interest in consecutive phases of the project.

It became evident from the interviews that there is a clear preference for a well-envisioned spatial plan. With such a plan, actors can better assess the expected benefits of their involvement in the RGA project. In general, project developers seem to be more resistant to, and sceptical of the use of the RGA, compared to public authorities and NGOs. This resistance is often based on the perception that planning approaches such as the RGA are costly and hinder economically beneficial developments. However, a strategic vision was beneficial for changing these perceptions, as it often demonstrated that economic benefits could be optimized by integrating *red* and *green* land-use planning functions. In

several case studies, higher sales benefits were expected due to the increased social value of houses placed in *green* surroundings.

A vision that is jointly developed by all actors may contribute to identifying and generating socio-economic benefits of the RGA projects. Nature conservation issues are then no longer seen as a threat to regional economic developments, but are simultaneously addressed, with an emphasis on finding opportunities where both functions may reinforce each other. This may significantly speed up establishing both *red* and *green* functions, as with a joint vision actors may become more proactive. One interviewee noted: “In the Netherlands, the primary focus of planners is on red developments, and less on how these developments can be used for investing in nature development or conservation measures. The use of an RGA may change that”.

A number of interviewees expressed concerns that the RGA approach may be used by project developers to more readily plan *red* developments within or in proximity to NEN, arguing that the expected loss of habitat will be restored elsewhere. They emphasized that rigorous analyses of the actual nature values in the planning area and the potentials for nature development are needed to optimize the conditions for developing NEN. After all, specific conditions are needed to allow for the compensation of lost nature. Consequently, the promising locations for *green* developments must be explored, and no-go areas should be identified within the RGA plan. An agreed-upon strategic vision is an important tool to clarify such planning restraints in advance.

3.4.2 Communication between actors

About 90% of the interviewees pointed out the high importance of direct, frequent communication between all actors involved in the RGA projects. A carefully designed communication process is the most efficient way to identify the particular interests and ambitions of each actor and explore possible solutions for conflicting interests. Furthermore, it is important to use all available expertise and experience that results in stronger support and commitment from actors. One interviewee stated: “You have to ensure that in an early phase of the project the interests of the parties are discussed and the possible collaboration is identified in terms of how actors can benefit from each other”.

However, communication should not be limited just to the actors. It quickly became clear in some of the cases that effective communication process was also needed to inform the local communities and consider their interests. Although the local communities were usually represented by one or more NGOs, this was not always perceived as sufficient. While NGOs judge the pros and cons of the total plan, individual or groups of citizens are more likely to focus on one or two parts of the plan that may affect their personal interests. This is a consequence of the so-called *not in my back yard* (NIMBY) principle. Local communities must be well informed from the earliest planning stages about the goals and expected outcomes and potential benefits of the RGA project, making clear how integrating urban functions with NEN improvements may contribute to the quality of life and the sustainability of the entire local area.

The specific forms and intensity of communication in a project are usually decided upon in the collaborative agreements signed by the actors at the start of the project. In public-private partnerships (PPPs), the RGA is usually based on reciprocity. In other words, private and public parties have something to offer to the other, but also need the cooperation of the other party to reach their own interests. Both sides often quickly recognize the importance of a carefully designed communication process to reach consensus for a PPP agreement. One interviewee stated: “The driving force behind a PPP is the recognition

of the interdependence between the different actors in achieving the goals of the proposed plan". Understanding this inevitability of collaboration helped prevent one or two actors from dominating the planning and decision-making process. The same applies for public–public partnerships (PuPs). Public authorities often have quite fragmented administrative structures and cultures that hinder efficient communication between professionals and decision makers. Explicit collaboration agreements are essential to streamline communication and the agreed-upon division of tasks and responsibilities. If consensus cannot be achieved between public authorities, the RGA cannot be effectively implemented. This is also true for the communication process within the organizational structures of public authorities, such as between the planning departments and the environmental and nature conservation departments. In most of the cases studied, to one degree or another impediments were observed regarding collaboration during the entire planning process of the projects and the accompanying decision-making. In this regard, one of the interviewees stated that although private actors often compete with each other, they find practical ways to collaborate more quickly compared to public actors: "Private parties seem sometimes to find more easy ways to collaborate than the public authorities, which is based on their fundamental similarities and working perceptions such as continuity of the business. By making the competitors interested in a partnership, a company can progress in the market with fewer competitors". This was not the case for the public authorities involved in the RGA projects, which appeared to have more rigid and time-consuming communication processes due to fragmented administrative structures and more hierarchically oriented decision-making processes.

Meanwhile, several interviewees indicated that the communication process was most successful when there were mutual trust and an initial willingness to reach a common understanding during the RGA planning process. Reaching a common understanding greatly depends on creating an open communication process in which actors can freely express their visions, interests and fears. Actors may have wrong perceptions about each other. Public actors may have the perception that private actors are mainly interested in quick financial benefits. Private actors may have the perception that public actors' bureaucracy inhibits their creativity and flexibility in planning (PPS Bureau 2004). Overcoming such perceptions is an essential step in any RGA project. It allows for more transparent deliberations and quicker results from actors who respect each other's opinions and interests, even if these are not necessarily shared. It encourages a process of learning and helps to achieve mutual trust, which is often a key factor for the success of a project. One interviewee stated: "The formal and informal interaction between the actors has helped them to learn about each other and from each other. Of highest importance is that actors trust each other. Therefore, parties need to put extra efforts into establishing a trustful relationship".

Communication was most successful when based on more informal horizontal relationships between actors across organizational structures, rather than on hierarchical, top-down power relationships. The initiative for such a communication process within the RGA projects was usually taken by the public authorities and followed up by the public–public or public–private partnerships agreements. Each RGA project formed a unique communication process which was dependent on the leadership, the motivation and the bargaining capacity of the public and private actors.

3.4.3 Shared responsibilities

All actors' commitment to and responsibility for reaching the project goals are important for the success of a RGA project. Several interviewees emphasized that *green* functions in a spatial plan, such as one for the development of a NEN, should no longer be the sole responsibility of the governmental authorities or nature conservation-oriented NGOs. Instead, *green* developments should be a shared responsibility of all actors. All actors must accept and consequently act upon the idea that neither *red* nor *green* developments can go forward without the other kind of development. As was observed in a number of the RGA projects, when all actors acknowledged the need for sharing responsibilities on the RGA developments, compromises could be reached more easily. In this case, key bottlenecks such as lack of coordination between the different developments or absence of dialogue and consensus building process about the plans could also be solved, and more of the initial ambitions could be met.

Currently, there is no legal framework at the regional level to regulate or guide the initiation and the management of RGA projects. Most RGA projects are initiated by provincial authorities alone, based on their emerging planning ambitions. In most cases, the incentives to start an RGA project are related to implementing provisions of the NEN national policy in the regional plans. Provincial ambitions regarding NEN objectives are usually high at the beginning of the RGA projects. The authorities, however, are well aware that implementation will be challenging, particularly with regard to the involvement of different stakeholders at the earliest stages of the project and the way the responsibilities and roles will be divided between them in the planning process. In this context, the role of the RGA as a planning process that integrates different developmental objectives tends to be perceived as a structured form of collaborative planning that clearly outlines the shared responsibilities in joint agreements between actors.

3.4.4 Economic incentives

The interviewees mentioned economic incentives as a success factor for the RGA as a way to attract private investments in regional developments and identify opportunities for financing the development of NEN at regional level. In the cases studied, housing developments were the main economic incentive offering a return on investments and explaining the interest of private actors, such as project developers, to join an RGA project. One of the common statements among project members of the RGA regarding the economic outcomes of the RGA developments was that: "RGA is interesting for developers only if this will deliver benefits for investments in housing or infrastructure".

One complicating factor in this respect is that the economic benefits are sometimes difficult to predict, due to the dynamics in the land and housing markets. Therefore, expectations of economic benefits and consequent possibilities for co-financing *green* ambitions may be inaccurate. In case studies where this occurred, the project often suffered from serious delays. RGA projects require both private and public parties to estimate possible financial risks due to the land and housing market and embed these in the formal agreements. As observed by an interviewee: "While in the first phase of the project many ambitious ideas are considered, there is also a strong need for the actors to consider the commercial and political risks that may occur".

According to public authorities, another complication is that *green* ambitions in some regions may be too high to be fully funded by *red* developments. For example, in areas

where the aim is to develop robust ecological corridors, available space for *red* developments is relatively limited. One interviewee mentioned: “There is a growing scarcity of locations for urban developments. As a result, the developers might have a surplus of financial resources. There should be more areas where, with relatively small *red* developments, significant profits can be gained in order to co-finance relatively large *NEN* developments”. In this regard, other interviewees emphasized that fully funding *green* developments from the profits of *red* projects are not always the best choice. If land prices are high, this may result in a lot of *red* for only a little bit of *green*. This statement emphasized a more common perception of RGA participants that implementing the *NEN* policy and targets has a public value and, in line with the private actors’ contributions, it should always be co-financed by the government: “You do not wish to finance green developments only with private funds. Often the ambitions are so high that concessions are made, eventually resulting in red developments invading the green areas more than planned. This may compromise the value of the green assets and their ecological functionality”.

3.4.5 Efficient land-use planning procedures

One-third of interviewees mentioned efficient land-use planning procedures as a success factor for RGAs, in which clear steps are distinguished to designate both *red* and *green* land-use functions. Within the Dutch regulatory framework of land-use planning, a number of procedures for zoning and designation, acquisition, and expropriation of land can be used in RGA projects. The efficiency of these procedures is based on creating smart combinations of designated land uses that benefit most of the actors involved in the RGA project. The accompanying negotiation process to implement the land-use procedures and provide the land for *red* and *green* functions has been crucial to the efficiency of land-use planning procedures.

In the cases studied, the efficiency of the planning procedures greatly depended on the proportion of land owned by the government within the project area. If most land is government owned, planning ecological corridors as part of *NEN* is easier and implementation is more likely to be a success story, compared to cases in which private developers own most of the land and/or public authorities must negotiate with private landowners about possible land acquisition, purchase or land expropriation. In such cases, time-consuming negotiations were often needed to reach consensus regarding proposed land designations for *red* or *green* functions, and to outline the financial mechanisms to compensate landowners for *green* developments.

Furthermore, land ownership largely determined actors’ power positions in the planning process. In this regard, within the RGA projects four key strategies could be distinguished that were applied to ensure efficient acquisition of the needed lands. A first strategy is agreeing that the government has the right of first refusal if private landowners decide to sell their property. High cost for land acquisitions can be prevented since such agreements hinder speculative acquisitions by project developers. It is important that negotiations on the financial framework between private and public actors are finalized and a PPP agreement is signed before the project is publicly announced.

Proactive acquisition of land by the public authorities before or at the start of the RGA project is a second strategy. Such land acquisitions are usually not limited to land within the project area itself. Land outside the project borders is also acquired to be able to offer landowners a land-for-land option.

A third strategy used was to maximize flexibility in the plan, such as by developing different scenarios for the *green* ambitions. One interviewee advised: “You should be sufficiently flexible in your plan, so you will not be dependent on a particular square metre of land, because it is evident that if you need just that piece of land, you will pay the jackpot for it”.

A fourth strategy is land expropriation. This strategy was only used if land acquisition stagnated as a result of land price speculation or landowners’ unwillingness to sell land that was an indispensable part of the plan. Land expropriation is usually not the first choice (see Table 1), but may become necessary to secure project progress or ensure that planned *green* developments can take place. However, the issue of land price becomes particularly delicate in land expropriation for NEN proposes, because landowners might be forced to sell their land at a low price to the same government that designated land uses.

4 Discussion

In our research, we evaluated the suitability of the RGA to integrate the key objectives of the NEN implementation into regional spatial plans. By assessing seven case studies in which the RGA was applied, we explored its potential to contribute to integrated and therefore more sustainable land-use development and achieve a higher degree of EPI. We identified the key success factors for implementing the RGA based on this assessment.

Our findings show that the use of RGA has not yet been firmly institutionalized in the spatial planning policy and land-use planning practices of national, regional and local authorities in the Netherlands, but that it is more of an ad hoc approach. However, interviewees shared the opinion that the RGA will be of great benefit if it is embedded and channelled within spatial planning policy at regional and local level. They believe that, with a more solid institutional basis for RGA as an integrated form of land-use planning, private actors can be better encouraged to invest in *green* developments, and funding for the compensation of the loss of natural areas due to *red* developments can be more easily secured.

At the same time, it became evident that certain legal provisions alone will not fulfil all the RGA needs. In conformance with earlier studies in the EPI literature (Simeonova and van der Valk 2009; Jordan and Lenschow 2010), it has been found that while legislation can provide the rules of the game, it cannot replace the need for actors’ strong commitment. Actors should be convinced that multiple development needs can be met through the RGA in the spatial plan. This requires a stronger collaborative attitude and more communication skills than those required in more conventional planning approaches, where regulations and governmental hierarchy usually play a more dominant role in decision-making. RGA projects emphasize the deliberation process for negotiating a shared vision on the spatial development goals. While these negotiations in the first stages of a planning project require more effort and usually take more time than the more conventional planning approaches, most interviewees agreed that they pay off at later stages in the planning process. Although a signed agreement between the actors is indispensable in this respect, the success of an RGA project also greatly depends on the quality of the relationships between the public and private actors.

An essential element in this process is the proactive role of the regional authorities towards both private actors and other governmental agencies. Although the Dutch national policy on establishing the NEN promotes integrated, nature-friendly spatial developments, applying the RGA is not mandatory. The use of the RGA greatly depends on the ambitions

and the initiatives of the regional authorities. This is evidence of the challenges that the EPI process faces at regional and local level in light of the ongoing decentralization spurred by many European states (Stead and Meijers 2009; Scholz et al. 2012; Simeonova and van der Valk 2016).

In addition, our research illustrates that no two RGA projects are the same in terms of ambitions, objectives, planning process or agreements between actors. This makes RGA projects complex, but simultaneously allows for tailor-made planning solutions that address the needs of a specific regional development initiative. It became clear in the seven case studies that how agreement is achieved between all actors differs for each project and is a very dynamic, complex process. However, deliberations allow for a certain amount of flexibility regarding the choice of the planning instruments, the design of the communication and negotiation process, the division of responsibilities and the financial mechanisms needed to implement the RGA project. The advantage of this flexibility, compared to more rigid conventional planning processes, is that specific ways of working can be designed for each project that fit best with the local situation and preferences of the actors involved. This advantage results in differences both in agreements between RGA projects managed by different regional authorities and between projects initiated by one regional authority. This brings into focus the context-related aspects upon which the success of EPI may depend and that have to be taken into consideration in the development of EPI approaches in urban planning. RGA exemplifies the understanding that EPI is strongly related to the need to reconcile competing policy objectives involving a multiplicity of actors in a complex societal arena (Jordan and Lenschow 2010). We have shown that regional use of the RGA can enhance the functionality of the NEN. Within the projects explored, one particularly beneficial outcome for the NEN was the development of a number of substantially important ecological corridors. In this relation, the RGA could be seen as a promising approach towards progress with the implementation of the NEN at national scale.

The benefit that the RGA offers to this NEN process is that it allows actors to no longer limit their focus to individual *green* developments on a local scale, but to look at the whole picture as a cluster of interdependent *green* developments that should be addressed together to achieve ultimate coherence and conservation targets of the NEN. Although the development of the NEN cannot fully be realized just through RGA projects, the RGA seems to be suitable for addressing *green* ambitions in densely populated areas where urbanization exerts high pressure on nature. It illustrates a new form of land-use planning at the regional and local scales of spatial development, designed to embed conservation objectives within the land-use planning process (Van Rij 2005). Nevertheless, RGA use at the regional level is not a common practice. Some interviewees explained that there is still some hesitation about routine use of the RGA due to its complexity with regard to planning procedures, financial arrangements, multiple actors' involvement and timely negotiations. Nevertheless, most regional authorities agree that the approach helps to raise general awareness that *green* developments are not necessarily solely a governmental responsibility. The RGA promotes integrated planning, meaning that *red* and *green* ambitions are simultaneously addressed with even weight. Although *green* developments were a priority objective in most of the case studies, the RGA has proved that it is not only that *red* projects pay for *green* ones, but also that *green* projects improve *red* ones, for example, by providing economic benefits as a result of increased real estate values due to high-quality *green* space surrounding the *red*.

Several of the cases showed that successful implementation of *green* ambitions greatly depended on a clear vision of what the *green* developments should be in the earliest stages of the project. An elaborated plan, in which the necessary *green* areas, their spatial

configuration and the conservation objectives within these areas are specified, will result in better incorporation of NEN ambitions in the final plans, compared to projects in which *green* developments were not specified. Such a vision streamlined the deliberations between actors, as it prevented unexpected or new demands with regard to *green* developments at later stages in the project.

It is essential for the RGA to balance power relationships and build trust between actors. The formalized actors' agreements play a key role in this respect, as these should outline the roles and responsibilities of the actors. The agreements, such as the PPPs and PuPs, should be based on a consensus among all actors. Incomplete agreements may result in conflicts, disturbed relationships or even legal battles. The essential issue for consensus building is acknowledging public and private interests, potential risks of the RGA agreement and how these risks will be divided among the actors during the RGA planning process. Furthermore, it is essential that the cross-subsidizing mechanisms also be agreed upon among all actors, such as how *red* developments will contribute to *green* ones.

RGA projects have an added value in that they improve the image of the actors involved and this applies to both public and private actors. For governmental authorities, they are a clear means to demonstrate their interest in protecting the environment and, specifically, their support for developing and restoring *green* areas, including ecological networks. This may strengthen the position of a region, as RGA projects may change the view of both private actors and the public on the attractiveness of an area to live or start an economic activity. They can also be a means for private actors to show their ambition to conduct nature-friendly businesses or actively put efforts into improving natural values. Although such benefits will not necessarily improve the quality of a spatial plan, they may result in greater commitment from the actors, fewer obstacles during the planning process and a greater chance of the project being implemented successfully.

5 Conclusions

The growing pressure on natural areas due to land scarcity, urbanization and the general call for decentralization of development activities in favour of regional governments in the Netherlands has increased the need for planning approaches such as the RGA which can support the achievement of EPI. Using profits from property development is a possible way to finance the development and maintenance of nature areas. However, a key element of the RGA is the collaborative planning process that it involves. In this study, we have shown that the RGA is a balancing approach, but to a high degree it is also a collaborative planning tool that regional authorities, private developers and nature conservation parties can use to develop parts of the NEN. RGA is actual evidence of an EPI-oriented practice that is based on a communicative form of planning. It also illustrates the context-specific factors influencing planning decisions about competing policy interests. The RGA provides tailor-made solutions for balancing *red* and *green* land-use functions by promoting more integrated planning instruments, facilitating communication between multiple actors and offering new financial incentives. Although opinions differ among regional actors about when and how to use the RGA, current experiences demonstrate the vast array of opportunities that it offers for achieving complementary purposes, such as ecological developments alongside conventional land-use planning aims.

Our research shows that nature conservation objectives can be part of collaborative RGA planning processes initiated by regional governments. The RGA is also a

collaborative process that crosses the boundaries of private and public interests and actors' perceptions. The case studies illustrated that the RGA supports regional governments in speeding up the needed NEN ecological developments, based on their jurisdictions, status and authority. Private actors, such as project developers, can also benefit from engaging in RGA projects by designing innovative developments while investing in improving quality of life of an area and a region. Meanwhile, some regional actors are concerned about the struggles with insufficient public funding for developing the Dutch NEN and whether the RGA alone can meet these needs. However, others viewed positively the opportunity offered by the RGA to create public–private partnerships that increase actors' overall awareness, considerations and desire for investments in NEN. The RGA provided provinces with a means to orient their initial ambitions towards development that is not restrictive, but based on sustainability principles in which economic opportunities can provide better quality of life and nature. The RGA can prevent economic developments being made at the cost of actual or potential natural values. The RGA proves that in many cases the EPI process in the field of urban development will need to be based on specific planning solutions based on each development plan and a mix of planning instruments, including procedural, strategic and collaborative instruments.

The key success factors to RGA include: (1) actors' communication; (2) strategic vision; (3) shared responsibilities; (4) economic incentives; and (5) efficient land-use procedures. Of these, we conclude that the communication between actors is the most important success factor. Within all the case studies, the communication between actors was an ongoing process that influenced the outcomes of all planning stages. Ensuring successful communication between actors, while also understanding the particular regional setting, institutional and organizational interactions, and the public and private actors' relationships, is the most challenging and unpredictable endeavour of the RGA and hence the greatest obstacle to achieving EPI. While this process requires serious effort and a proactive role on the part of regional authorities, it still offers an attractive perspective for more sustainable regional developments. Despite a few observed complexities in RGA implementation, such as too high initial ambitions, sudden financial constraints and longer implementation time, most projects can be considered successful. We can thus conclude that RGA did contribute, to some degree or another, to the realization of at least a substantial number of the NEN ecological developments and of the enhancement of the NEN overall.

The RGA serves as an alternative to the more conventional planning practices in which powerful economic forces often hinder *green* ambitions. Although the RGA still possesses a number of challenges and dilemmas, it offers ways to mediate between competing demands for land in favour of nature conservation goals. RGA is promising and can be characterized as a communicative approach to the implementation of the EPI principle in regional spatial planning. Last but not least, the RGA remains a fairly unique approach and its potential needs to be further revealed in the EPI debate and the planning discourse in line with the emerging planning practices. Finally, the credibility of the EPI principle and its current approaches at regional and local level need to be further explored in a wider European perspective of sustainable urban development and planning.

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Appendix 1: Short description of the case studies

Project	Initiator	Aim of the project	Red ambitions	Green ambitions	Actors and type of agreements
1. <i>Meerstad</i>	<i>Province of Groningen</i>	Developing a multifunctional area (2400 ha) for housing, business, water management, recreation, an attractive landscape and a robust ecological corridor as part of the national ecological network	Housing (700 ha; 10,000 houses) Business activities, services and sport facilities (162 ha)	Recreational area, including a lake (1400 ha) Ecological corridor (395 ha) between Groningen and Zuidlaarder lakes in Drenthe (Natura 2000 area) Habitat restoration outside the project area, compensation of habitat loss due to <i>red</i> developments (250 ha)	<i>Public</i> Ministry of Economic affairs Province of Groningen Municipality of Groningen Municipality of Slochteren <i>Private</i> AM Grondbedrijf B.V. Hanzevest Ontwikkeling B.V. Heijmans IBC Vastgoedontwikkeling B.V. BPF Bouwinvest LTD <i>Agreement type</i> PPP
2. <i>Blauwe Stad</i>	<i>Province of Groningen</i>	To stimulate the regional economy by developing 1500 ha for attractive living and working environments. Creating a lake and surrounding housing, nature and leisure facilities. Transforming open and agricultural areas	Housing: land for building plots (160 ha; 1480 houses)	Development of a lake for recreation and nature (800 ha) and separate nature areas (350 ha) as part of NEN, including an ecological corridor	<i>Public</i> Province of Groningen Municipality of Reiderland Municipality of Scheemda Municipality of Winschoten Water Authority State Forestry Service Provincial Conservation Society <i>Private</i> Developers' union Management body De Blauwe Stad B.V. <i>Agreement type</i> PPPs

continued

Project	Initiator	Aim of the project	Red ambitions	Green ambitions	Actors and type of agreements
3. <i>Hart van de Heuvelrug</i>	<i>Province of Utrecht</i>	Restoring nature by developing ecological corridors, combining housing, services and recreation. By a "chess" planning model, allow exchange of areas for <i>red</i> and <i>green</i> functions, and achieve positive balance with connected natural areas. Regional clusters of projects	Housing, services, and business areas. The <i>red</i> functions shall be the same in size as the <i>green</i> areas	Development of large natural area in the country with ecological corridors Construction of five wildlife overpasses and two robust ecological corridors	<i>Public</i> The Province of Utrecht Municipality of Soest Municipality of Zeist Municipality of De Bilt Municipality of Leusden Municipality of Amersfoort Five Ministries NGO Utrechts Landschap <i>Private</i> Abrona, Altrecht, Reinaerde Pro-Rail <i>Agreement type</i> PPPs: "Platform Hart van de Heuvelrug"
4. <i>Wieringerrandmeer</i>	<i>Province of Noord-Holland</i>	Development of a lake to give a new socio-economic impulse to the Kop van Noord-Holland region by providing opportunities for recreation and services. Making robust ecological corridors between the IJsselmeer and North Sea	Housing: (2100 houses) Extension of recreation terrain and marinas	Development of a lake to connect IJsselmeer and Amstelmeer lakes	<i>Public</i> Province of North Holland, Municipality of Wieringen Municipality of Wieringermeer Municipality of Hoogheemraadschap Municipality of Hollands Noorderkwartier Domeinen Staatsbosbeheer WLTO Ministries of VROM, LNV, Finances V&W <i>Private:</i> Boskalis Volker Wessels Witteveen + Bos <i>Agreement type:</i> PuP and PPPs

continued

Project	Initiator	Aim of the project	Red ambitions	Green ambitions	Actors and type of agreements
5. <i>Park Lingezegen</i>	<i>Province of Gelderland</i>	Development of a regional park between the urban areas of Arnhem–Nijmegen (1500 ha), including public open space for recreation (370 ha), water retention (20 ha), agriculture (300 ha); ecological zones (69 ha), nature (255 ha), and other park zones and infrastructure	Recreational infrastructure and services Limited urban fringe housing on the park edges and estate developments within the park for public use	Regional green park: recreation, water, river landscape and nature (255 ha) Developing two ecological zones with stepping stones between the big river wall and the centre of Park Lingezegen (69 ha)	<i>Public</i> Province of Gelderland, City Region Arnhem–Nijmegen Municipality of Lingewaard Municipality of Over-Betuwe Municipality of Arnhem Water board Rivierland State forest agency Rural development agency <i>Agreement type</i> PuP Management group Park Over-Betuwe
6. <i>Zoetemer Zuidplas</i>	<i>Province of Zuid-Holland</i>	Redevelopment of 2080 ha from agricultural land to nature and recreation area in the province of Zuid-Holland. Improvement in the ecological structure of the forests and water area, and preservation of the open space between the surrounding cities	Sports fields outside the urban borders with compensation for nature in the Bentwoud Forest	Development of the Bentwoud Forest Three ecological corridors	<i>Public</i> Province of Zuid-Holland Municipality of Rijnwoude Municipality of Zoetemeer Municipality of Waddinxveen Ministry of Economic Affairs <i>Agreement type:</i> PuP between the public actors PPPs between private parties in land acquisition for the realization of green (450 ha). Recreatieschap Reeuwijk

continued

Project	Initiator	Aim of the project	Red ambitions	Green ambitions	Actors and type of agreements
7. <i>Marickensland</i>	<i>Province of Utrecht</i>	Development of nature and recreational area in the polder of Groot Mijdrecht South (500 ha). The aim is to preserve the open space between three core areas (Mijdrecht, Wilnis and Vinkeveen) by developing an ecological corridor between north and south of the area	950 houses next to the existing urban zone of Wilnis	Development of NEN nature (320 ha) combined with recreation (180 ha) Development of a NEN ecological corridor between: Vinkeveense Botschol and Nieuwkoopse Plassen with defragmentation measures across regional road	<i>Public</i> Province of Utrecht Municipality De Ronde Venen State forest agency Water boards of Amstel, Gooi en Vecht <i>Agreement type</i> PuP Negotiations with landowners for acquisition of the farmland to be owned by the municipalities and three developers

Appendix 2: Interviewed stakeholders

Case study	Interviewee			
	No.	Name of organization	Type of organization	Position
Meerstad Groningen	1	Province of Groningen	GOV-R	Policy maker
	2	Project Bureau Groningen Meerstad	GOV-R	Project manager
De Blauwe Stad	3	Province of Groningen	GOV-R	Project manager
Wieringerrandmeer	4	Municipalities of Wieringen and Wieringermeer	GOV-L	Project manager
	5	ACRO Consult	PRC	Consultant
Hart van de Heuvelrug	6	Association Landscape Utrecht	PNP	Expert
	7	Municipality Soest	GOV-L	Policy maker
	8	Province of Utrecht	GOV-R	Project manager
	9	Program Bureau Hart van de Heuvelrug	GOV-R	Project manager
Marickland	10	Province of Utrecht	GOV-R	Project manager
	11	Municipality De Ronde Venen	GOV-L	Project manager
Zoetermeer Zuidplas	12	Province of Zuid-Holland	GOV-R	Project manager
	13	Agency for spatial planning	GOV-N	Project manager
Park Lingezegen	14	Province of Gelderland	GOV-R	Project manager
	15	Water agency Rivierenland	GOV-N	Policy maker
Non case-related interviewees	16	NEPROM Association of developers	PRC	Director
	17	Agency for spatial planning	GOV-N	Expert
	18	Technical University of Delft	UNI	Researcher
	19	Technical University of Delft	UNI	Researcher
	20	Wageningen University	UNI	Professor
	21	Alterra	UNI	Senior researcher
	22	National Fund for Rural Areas	PNP	Expert/consultant
	23	National Fund for Rural Areas	PNP	Expert/consultant

GOV-N Government, national, *GOV-R* Government, regional, *GOV-L* Government, local, *UNI* University, *PUC* Public Commercial Organization, *PRC* Private Commercial Organization, including consultancies, *PNP* Private Non-profit Organization

Appendix 3: Interview questionnaire

General questions

1. What is your understanding about the RGA and its concept/idea?
2. Do you know if the RGA is institutionalized in the Netherlands in any regulations, contracts or financial arrangements?
3. When can you use RGA, and when not?
4. Is the RGA used on a regular basis within the planning practices of the regional and local authorities?

5. Why was the RGA chosen for a specific project?
6. Is the RGA a useful approach now and for the future, and why?

Specific questions related to the cases:

7. Which actors proposed applying the RGA in the project and why?
8. Which public and private actors were involved in the RGA project?
9. What benefits and advantages did the actors (public and private) consider to getting involved in the RGA project?
10. How was the RGA project organized (who took the initiative and the leading roles)?
11. How was communication between project actors organized?
12. Were there any conflicts during implementation of the RGA in the planning process of the project?
13. Were there any collaborative teams established between the actors involved in the RGA project?
14. Which essential interests and differences were observed among the actors involved?
15. Did any of the actors make use of their power positions during the RGA project? If yes, in what way?
16. What are the risks of applying the RGA?
17. Was the RGA development accepted by the local community?
18. What are the key success factors of the RGA and why?
19. Which land-use planning instruments did the regional authorities use to implement the RGA and why?

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