Making scenarios for nature policy in the Netherlands

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Abstract

The *Nature Outlook 2010 - 2040* was produced by applying the scenario approach. The outlook explores some alternative directions in which nature policy may evolve in the long term and the implications of this for nature policy in the short term. The subsequent building blocks of the scenario study enable policymakers to gradually gain insight into alternative desirable future states of nature and alternative policy-strategies to realize them. This is further stimulated by the character of the scenarios, which contain not only qualitative storylines, but also concrete images and quantitative information. In order to build such scenarios various methods were applied, like model calculations, scenario workshops, and design activities. By participating in the scenario study, policymakers not only provided valuable insights but also became more receptive for the results.

1. Nature Outlook as a source of inspiration

Recently, the PBL Netherlands Environmental Assessment Agency published the *Nature Outlook 2010-2040* (2012). The main objective of this scenario study is to inspire the present political and societal discussion about nature policy in our country. After some decades of ongoing efforts for developing a national ecological network, consensus has recently eroded. Nature policy is criticized now as being too much technocratic and legalistic and too little responsive to other societal interests, like outdoor recreation and building of industrial estates or roads. There is a lot of political and societal discussion now about a new direction of nature policy. This discussion is not only fed by the budgets which are cut in response to the economic crisis. Policy objectives are also under discussion. Furthermore, the government started a deregulation and decentralization program of nature policy (Wieringa and Van Oostenbrugge 2010).

The nature outlook intends to inspire policymakers and stakeholders involved in nature policy to think not only about policy-changes in the short term, but also about policy development for the long term (PBL, 2011). This happens among other things by presenting several alternative futures of nature and alternative policies to realize them. This is relevant for nature policy for various reasons. First, it's important to

avoid policy-decisions, which may later only be corrected at high costs. An example of this is building in natural areas that are important for biodiversity. Second, some decisions must be made now in order to realize desired results in the long term. For instance, it can take a few decades before a newly developed natural area is fully grown. Natural processes can indeed be slow and policy-making and implementation may also take some decades, particularly if land must be bought for nature development. But in the long term nature policy can be questioned again and the policy impacts may be uncertain (Van Asselt et al., 2007). Desires regarding the natural environment dominating society and politics today may change again. The same is true for the context of nature policy. This is clearly illustrated by the economic crisis and the radical budget cuts for nature policy in reply to this event. It's uncertain now how the economy will evolve in the next decades and which impacts this may have on nature policy.

This paper describes how the *Nature Outlook 2010 – 2040* was produced. First, it explains why scenarios were built (section 2). After that it describes the scenario parts that were made (section 3) and the methods that were applied (section 4). The paper will also explain which choices were made and which impacts they had on the results of the outlook. Finally, some lessons are drawn from the nature outlook that might be relevant for other scenario studies (section 5).

2. Nature Outlook as a scenario study

Various methods are available to help policymakers and stakeholders to better deal with the uncertainty regarding the future, such as trend extrapolations, computer simulations and creative brainstorming (Wright and Goodwin, 1998; IKR, 2005). Figure 1 gives an overview of the main *types* of methods. The degree of uncertainty of the future course of political or societal trends about which statements are made is decisive in this respect.

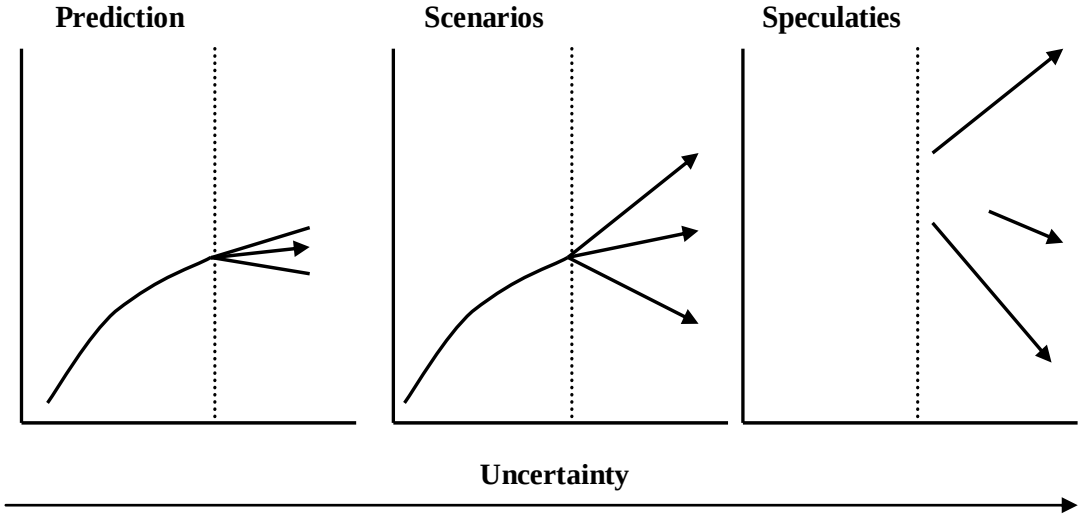

Figure 1. Prediction, scenarios, and speculations

A prediction provides a statement about a future trend, which is based on knowledge about that trend in the past and which is meant to be as accurate as possible. Since the future is always uncertain to some extent the statement is accompanied by a confidence interval, indicating an upper and a lower limit within which the trend may evolve with a specified probability. A prediction is made if the uncertainty regarding the future trend is limited. This may be the case if the trend is expected to be relatively stable or if the period which is taken into consideration is relatively short (Dammers, 2000). A statement about the expected climate change within ten years is an example of this.

Scenarios are narrative descriptions of possible or desirable futures that focus attention on causal processes and decisions (Kahn, 1965). They consist of statements about several alternative courses of future trends or other developments, based on knowledge about them in the past and the present. Scenarios are built when the future is uncertain, but not as uncertain as in cases in which speculations are made (see below). This is for instance the case if a development is known to be dynamic but not chaotic or if the period which is taken into consideration is long but not extremely long. The *Nature Outlook 2010 – 2040*, exploring alternative futures of nature and alternative policies to realize them, is an example (PBL, 2011).

Speculations provide statements about several alternative futures based on creative ideas or images about how these futures might look like. Usually, there is no link with a past or present trend or other development. Speculations are made if the uncertainty regarding future developments is large. This may be the case if the course of the development is expected to be chaotic or if the period which is taken into consideration is very long. An example of this is the possible development of the knowledge-based economy in the next 100 years.

Scenarios have an advantage over predictions because they can provide more inspiration. The reason for this is that they explore different directions in which nature policy may develop in the future, for instance in the direction of realizing several large scale natural areas or in the alternative direction of a great amount of parks and other green areas in urbanized regions. In addition, scenario's do more justice to the uncertainty regarding the long term future since they explore alternate directions in which political, societal and physical developments with an impact on nature may evolve. Scenarios have an advantage over speculations because the statements about the future they provide are more substantiated. Moreover, they offer more insight into the ways in which desired future states could be realize. As a result, scenarios provide policy recommendations that are more practical and concrete.

3. Building blocks of the Nature Outlook

Scenario-building is an eclectic activity, applying various methods like scenario workshops, essays, designing or computer models, and using various knowledge sources like expert judgments, literature review, imagination, and quantitative data. It's rather a global approach than a well-defined method (Dammers, 2010). Therefore, it is not self-evident that all building blocks of a scenario project that can be distinguished in theory are always made in practice. In the *Nature Outlook 2010-2040*, we have done this though. This scenario study consists of a scenario base, policy scenarios, context scenarios and policy messages.

The *scenario base* gives a description of the present situation of nature and nature policy in our country and how this situation has arisen from the past. The scenario base was made, because it provides a starting point to define the policy scenarios. The various images about nature that for many years now play a role in the political and societal discussion about nature policy provide a basis for the policy scenarios. In addition, the scenario base provides the possibility to compare desirable or possible futures of nature and nature policy with the present situation and thereby to indicate the required policy changes more clearly. Furthermore, the scenario base makes it easier to derive policy messages from the scenario study. For this requires not only that imaginable futures of nature and policy are taken into consideration but also the present situation.

Describing the past and present situations of nature included the identification of various policy problems. Important problems that were identified are decline in biodiversity, shortage of 'green' amenities, unsustainable use of natural resources, and hindrance of building activities by nature policy. Part of the analysis of the past and present nature policy was to make the various motives of people for being involved in nature conservation or development explicit. Important motives are the intrinsic value of nature, the esthetic quality of nature, the sustainable use of natural resources, and the utility of nature. By doing this the scenario team intended to inspire the present discussion about the direction of nature policy. A comparison of the problems and the motives provided four challenges for nature policy. These were in turn used to define four policy scenarios.

Policy scenarios describe alternative desirable futures of nature and alternative policies to realize them (figure 2 provides an overview). The challenges for nature policy, derived from the comparison of the bottlenecks and motives, were taken as a starting point. "Vital Nature" meets the challenge of improving internationally relevant biodiversity, "Recreational Nature" the challenge of improving the accessibility of natural areas and the esthetic quality of the living environment, "Functional Nature" the challenge of using natural resources, like CO_2 storage or biomass production, in a sustainable way, and "Flexible Nature" to reduce the costs related to nature development and the hindrance of other land-uses by nature. Policy scenarios are

normative since what nature an organization or group desires depends on its values (WRR, 2010). Each policy scenario describes how the challenge can be met and is also assessed on the degree to which it meets the challenges of the other policy scenarios. This makes the scenarios comparable and helps to derive policy recommendations from them.

Figure 2. Overview of policy scenarios

Context scenarios were developed in order to explore to what extent the policy scenarios can be achieved under different circumstances. These scenarios are descriptive (Becker et al., 1982). They explore in an integrated and coherent way some alternative future directions of economic, societal, physical and other trends with an impact on nature and nature policy (compare Wack, 1985). In addition, they explore how big the challenges mentioned before may become in the future, for instance, improving biodiversity in circumstances of high or low dynamics in land-use and environmental pollution. Furthermore, they explore the opportunities and threats for nature policy, for instance, in terms of the availability of public and private money.

Policy recommendations provide strategic points of interest to policymakers and stakeholders involved in nature policy. Recommendations are focused on the short term, formulated from views on the long term. Some recommendations were derived by comparing the policy scenarios with one another. On this basis, suggestions were made to combine parts of the scenarios, such as large natural areas which are made accessible for extensive recreation. Other suggestions were derived by comparing the policy scenarios with the scenario base. This makes the consequences for the current

policy clear, for instance, that there is always an important role for public organizations in nature development even if the market is highly involved.

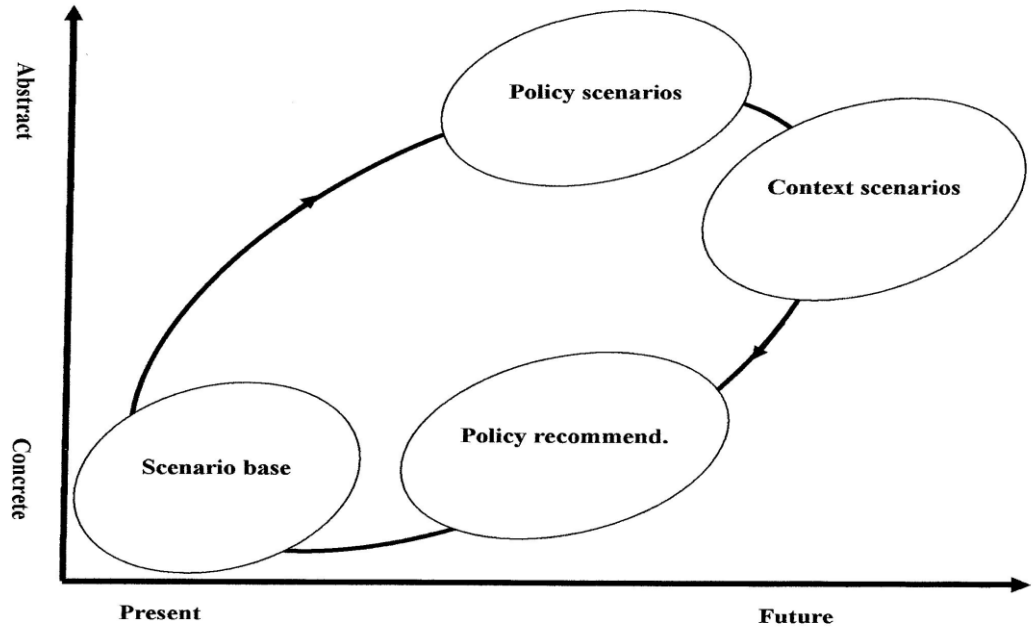

Figure 3. Building blocks are connected in a cyclical way

The building blocks just described are connected in a cyclical way (see figure 3). First, there is a cyclical movement in time. The scenario base focuses by definition on the past and the present. The policy scenarios and context scenarios explore desirable or possible developments in the long-term. And policy recommendations focus on the short term since they are formulated for current policymaking. Second, there is a cyclical movement in the measure of elaboration. The scenario base is relatively concrete since usually a lot of knowledge about the past and the present is available. The scenarios are necessarily more abstract since we know much less about the future, particularly about the long term. And policy recommendations are formulated in a more concrete way in order to provide policymakers and stakeholders strategic points of interest that are useful for them.

4. Applied methods

The building blocks can be developed in different ways using various methods. Each method has its strengths, but also its weaknesses (Dammers, 2010). Scenarios which are developed by model calculations often provide specific insights, because many variables and relations are made explicit and quantified. But the scope of these scenarios is usually limited, since variables and relations that cannot be quantified are excluded. Scenarios developed by designing are often very inspiring, because they present visionary images about the future. But the insights these scenarios provide

are often not very specific since they remain rather sketchy. Scenarios developed by workshops offer the possibility to let policymakers and stakeholders participate and thereby to mobilize a lot of practical knowledge. But the insights that workshops provide are usually less specific than those generated by model calculations since hardly any variables or relations are quantified.

Producing the nature outlook, the scenario team found it a challenge to apply the methods just mentioned in a combined way. By doing this, the team tried to exploit the strengths of the methods and to compensate their weakness as much as possible. Figure 4 provides an overview of the methods that were applied for each building block; the sections below provide an explanation.

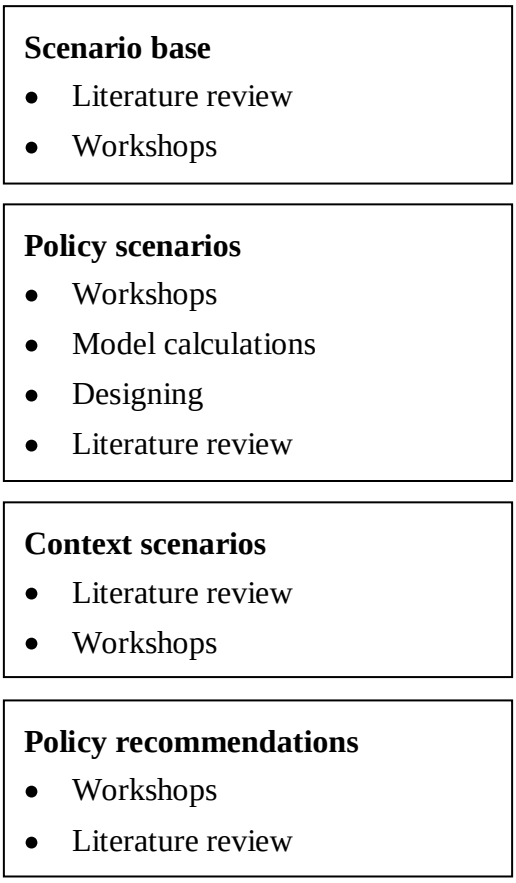

Figure 4. Methods applied for each building block

Scenario base

The scenario base was made by doing a literature review on the past and present situations of nature and nature policy. The developments, including the policy problems they generated, were mainly derived from the *Assessment of nature*, an evaluation study published every two years by PBL, and the *Assessment of the environment* (PBL, 2010), in which the assessment of nature is now integrated. In order to find the motives of organizations and groups a study was carried out into the history of their

involvement in nature conservation and development and into the changes that occurred in nature policy (Klijn, 2011).

The results of the literature review were checked by and discussed with experts on nature policy during workshops and interviews. These experts were employees of departments, provinces, municipalities, nature organizations, knowledge institutions and private companies. During the workshop the experts pointed to some aspects of nature and policy that should be taken into consideration, for instance, that natural dynamics at the local level (which is important for biodiversity) decreases and that the relationships between public organizations and citizens are important for the effectiveness of nature policy. These aspects, were included in the scenario base.

From these outcomes the scenario team derived the four challenges for nature policy. The team especially took policy problems into consideration that already exist for a long time and motives that organizations and groups already have for years. The policy challenges differ clearly from one another and therefore appeal to various organizations and groups: preserving and restoring internationally important biodiversity, making nature more accessible and perceivable, using natural resources in a sustainable way, and utilizing nature in a profitable way while reducing the hindrance for other land-uses. These challenges were presented to the participants of the above-mentioned workshops. This gave, however, no reason for adapting them.

Policy scenarios

The challenges were then used to define the policy scenarios. They became the most important building block of the nature outlook. The reason for this is that the political and societal discussion, as mentioned before, is focused on a new direction of nature policy and that the nature outlook is produced to inspire this discussion. For this building block also most methods were applied.

Four workshops were organized for making the policy scenarios: two workshops on terrestrial nature and two on maritime nature. The aforementioned experts participated in the workshops. The main criteria for their participation were: having much expertise about nature, being able to reflect on the long-term future, being able to think beyond the limits of one's own professional domain, and together represent a great variety of viewpoints on nature and policy (Dammers, 2010). The application of these criteria contributed to a rich harvest of ideas. Additional workshops were organized with experts from the Government Service for Land and Water Management (DLG), the recreation sector and building companies.

During the first workshop for terrestrial nature and for maritime nature the contours of the policy scenarios were drawn. This happened first by asking the participants to generate a large number of so-called guiding ideas about the future of nature in our country. Examples of generated ideas were "nature near home", "natural recycling",

and “interwoven nature”. Subsequently, the guiding ideas were clustered on the basis of their substantive consistency and the participants were asked to work out the ideas both in keywords and in sketches. In this way, the first rough versions of the policy scenarios were constructed.

The additional workshops with employees of DLG helped to work out the policy scenarios for various regions in the country and to make them more concrete. More than in the other workshops the focus was now oriented on policy strategies. For each policy scenario it was explored in which regions it could be realized and what measures would be required to do this. The workshops with the recreation sector and the building companies yielded additional information, e.g. about opportunities for extensive recreation in large natural areas and on the possibilities to achieve more nature in the living environments.

Interviews were conducted with experts who were underrepresented during the workshops, including experts from water boards and from the agricultural sector. These interviews also yielded new information, for instance about the fragmentation of land-use, generating high costs of water management and about the larger role that farmers could play in nature management if they were addressed as entrepreneurs instead of subsidy recipients.

The scenario team analyzed the results of the workshops and the interviews, clustered them into the four policy scenarios and elaborated them into storylines. The story lines represent the essence of the policy scenarios and integrate the many insights they contain in a meaningful way. This is important for the usability of the scenarios, since storylines are often easier understood and remembered than equations and graphs (Schwartz, 1991). Each storyline responds to a challenge that was defined in the scenario base.

During the elaboration of the story lines two criteria were applied: maximum consistency within the policy scenarios and maximum contrast between them (Van der Heijden, 1996). This contributed to the plausibility of the storylines and their imaginativeness. During the workshops also the names of the policy scenarios were defined: “Vital Nature”, “Recreational Nature”, “Functional Nature”, and “Flexible Nature”.

In the second workshops for terrestrial and maritime nature the results of the analyses and the elaborations were presented to the participants and discussed with them. The experts did various suggestions, for instance, to pay more attention to cultural history and to gradients from salt to fresh water. These suggestions were integrated in the further development of the policy scenarios.

Initially, the policy scenarios only had a qualitative character. Model calculations were done in order to quantify them. For each challenge it was calculated which solutions were possible. In addition, models and data were used to make the first sketches of the scenarios more concrete and realistic. For "Vital Nature" the Meta Nature Planner was used to calculate which environmental conditions had to be improved for creating favourable conservation status of species and habitats (Reijnen et al., 2007). Habitat suitability maps, based on soil conditions and current land-use, were used to determine where the relevant types of nature should be realized to improve biodiversity. For "Recreational Nature" the Hotspots Monitor (Sijtsma et al., in press) was used to calculate what existing nature should be preserved to maintain the experience quality and accessibility of nature. Experience GIS was also used to identify the locations where landscape should be improved. And AVANAR (De Vries and Goossen 2002) was used to calculate where deficits of hiking and cycling trails occur and extra recreational area is needed. Hiking and cycling are the most popular activities of outdoor recreation in the Netherlands. For "Functional Nature" various ecosystem models were used to determine, for instance, in which locations what type of nature is optimal for capturing CO_2 or for countering water floods. And for "Flexible Nature" the RuimteScanner (Hilferink and Rietveld 1999) was used to calculate where nature will disappear if other land-uses become more dominant.

Model calculations were not only done to make maps of the policy scenarios, but also to assess them. The Meta Nature Planner was used to assess the effects of all policy scenarios on biodiversity. AVANAR was applied to indicate which part of the future population in 2040 would be confronted with deficits of walking and cycling trails in their living environment. Information from the Hotspots Monitor was used to explore the experience quality of the policy scenarios. The LEI Cost-Effectiveness Instruments (De Koeijer e.a. 2006) were used to calculate the economic costs and benefits of nature development and management.

For maritime nature no model calculations were done, because suitable models were missing. There were, for instance, no allocation models to calculate the most optimal locations for functions, such as aquaculture, wind energy, and sand extraction. And the use of models for the assessment of the policy scenarios on biodiversity was limited by the large spatial variation and temporal dynamics of ecosystems in the sea and the lack of understanding of the sensitivities of the ecosystems and the dose-effect relations. Therefore, the elaboration of maritime nature in the scenarios relied on expert judgement and simple techniques, such as a comparing a map indicating future uses of the sea with a map indicating the locations of ecosystems.

Design activities played a role in making maps for the policy scenarios. These activities were closely interwoven with the model calculations. On the one hand, the sketches made during the workshops were the basis for the maps that were calculated. On the other hand, the results of the model calculations were modified into simplified maps. For terrestrial nature the detailed model calculations were simplified

via GIS analyses. In this way the scenario team tried to prevent users from interpreting the policy scenarios as blueprints (Van Hinsberg et al., 2011). The simplified maps express the essence of the scenarios by indicating in a rough way what types of nature can occur on which locations. The simplification also made it possible to integrate the maps of terrestrial nature with those of maritime nature. These maps were immediately displayed in global way since no model calculations were done for them. Drawings, sketches, and photographs were used make the scenarios more imaginative.

The policy scenarios were further elaborated by literature review. This was especially true for those parts of the scenarios that could not be calculated since data on the national level were missing, such as the locations of parks and green working environments. With this information the storylines were further improved. The policy strategies for terrestrial and maritime nature were also further elaborated by literature review (Bolman and Goldsborough, 2011; Verburg et al., 2011). Research publications, scenario studies, policy documents and other literature was used to gain knowledge of important aspects of policy strategies, such as coalition formation, strategy development, policy measures, financing, et cetera.

On the basis of literature and through logical reasoning, the scenario team constructed a specific strategy for each policy scenario. Each strategy can be considered an example of how a desired future regarding nature could be realized. “Recreational Nature”, for instance, could be realized by provinces taking the lead in regional policy networks, by putting co-designing into practice, by combining public and private financing in regional funds, et cetera. And “Functional Nature” could be implemented by public and private organizations and research institutes cooperating in innovation networks, by providing freedom to experiment with new ecosystem services, by establishing regional business enterprises et cetera. During the construction of the strategies principles of the welfare theory were applied, e.g. principles regarding public goods, external effects, market forces, and coordination issues (Stiglitz, 1988; Kuiper and Evers, 2011). The results of these activities were also discussed with experts during the workshops. Suggestions made by the experts, for instance, to pay more attention to new coalitions for nature development and to new arrangements to finance nature development were helpful to further elaborate the strategies.

Context scenarios

The context scenarios were developed by doing literature review and organizing workshops. The scenarios were based on the existing scenario study *Prosperity, welfare, and quality of the living environment* (CPB et al., 2006). This study contains four context scenarios: “Global Economy”, “Transatlantic Market”, “Strong Europe” and “Regional Communities”. Only the first and the last mentioned scenario are include in the nature outlook, because they explore more or less the highest and the lowest dynamics in demography, economy, and other trends in the coming decades. As a result they roughly represent the largest and the smallest pressure on nature in terms of environmental pollution and land-use. Because of that, they suffice to ex-

plore the possibilities and limitations for realizing the policy scenarios under different circumstances. Moreover, to inspire the political and societal discussion about nature policy it's important not to make the scenario study more complicated than necessary. Furthermore, the policy scenarios and not the context scenarios are the most important building block of the nature outlook.

From both scenarios only trends with an impact on nature and nature policy were selected to be included in the nature outlook, such as economic growth, food production, and energy supply. For some trends the scenarios had to be updated, since they were no longer plausible in the light of present knowledge. Because of the expected food crisis in the world, for instance, agriculture can no longer be expected to be subordinate to other forms of land-use in each scenario (Stegeman et al., 2011). In addition, sustainable energy policy is more ambitious now than expected in the scenarios. The reason for this is that only measures that the Government had officially decided on at the time of publication were included in *Prosperity, welfare, and quality of the living environment*. Two trends were added in the nature outlook which have an impact on nature and nature policy but receive little attention in the former scenario study: the changing attitudes of people towards nature and the changing institutional setting, i.e. the relations among public organizations and between public and private organizations, including the EU. These trends were explored by literature review and by expert judgement. Because of these amendments the scenarios were renamed into High and Low scenario.

The scenario team summarized the results and presented and discussed them with the experts. This happened during the second workshops for terrestrial and maritime nature. The experts stressed, for instance, that a distinction should be made between people's attitude towards nature and their attitude towards nature policy. They also informed the team there that several studies on future oil and gas exploration at sea were available. These reactions were particularly important for exploring trends with an impact on maritime nature since these trends are not included in *Prosperity, welfare, and quality of the living environment*.

The context scenarios were used to explore to what extend the policy scenarios could be realized and what resources and efforts would be required for that. The available budgets of the national government for nature policy in the context scenarios, for instance, were compared with the costs related to the realization of the policy scenarios. This provided information about the recourses that should be generated by other public organizations, nature organizations, business, et cetera. In one case, the context scenarios provided input for the model calculations that were done to elaborate a policy scenario. In "Flexible Nature" the land-use demanded for building houses and offices in green environments was derived from the context scenarios (Van Hinsberg et al., 2011).

Policy recommendations

The policy messages were based on the workshops and literature review. Three workshops were organized in which participants could derive ideas for policy messages from the scenarios or come up with their own ideas. In two workshops ideas about parts of the policy scenarios that can or can't be combined were generated. The combination of "Vitale Nature", "Functional Nature", and "Recreational Nature" in the coastal zone may improve biodiversity, recreation and water safety. But agriculture in a peat meadow area can't be combined with CO_2 capture since the latter requires a much higher water level. In the third workshop the participants could generate ideas about themes for the policy recommendations. Examples were "nature in the heart of the economy" and "diversity of nature types caused by diversity in urbanization".

The scenario team selected and checked the ideas that were generated during the workshops. A criterion for selection was that the ideas should focus on themes that were also explored in the policy scenarios. But this didn't withhold the team from adding themes to the scenarios that were mentioned in the workshops. An example of this were ideas about the added value of financial arrangements, like regional funds, over separate financial flows. The ideas were checked for their relevance for nature policy by comparing them with the results of the literature review and by expert judgement.

5. Lessons for other scenario studies

This paper described the way in which the *Nature Outlook 2010 – 2040* was produced, the choices that were made during the production, and the impacts of the choices on the results of the outlook. In this final section we draw some lessons from the scenario study that might be relevant for other scenario studies. The policy scenarios were defined by taking nature images that already play a role for years in the political and societal discussions as a starting point. The advantage if this was that truly different policy directions could be explored and that various organizations and groups involved in nature policy can easily identify with them, as was apparent from the workshops.

The nature outlook includes all building blocks that can be distinguished in a scenario study. Therefore, it provides policymakers and stakeholders using the scenario study the opportunity to explore the alternative policy directions as well as their implications for current nature policy step by step and thereby to learn from them.

Various methods were applied to produce the building blocks: workshops, literature review, designing, and model calculations. Because of that, the scenarios contain not only qualitative storylines, but also visualized images of the future and, where possible, quantifications. Besides, more knowledge resources were mobilized than had been possible if only an individual method was applied.

Policymakers and stakeholders were actively involved in the production of the building blocks. This enhanced their receptivity for the scenarios, as contacts with them indicate. The reason for this is that they consider the scenarios not as being produced by other people but as produced (among other people) by themselves.

There are also lessons that can be drawn from some suggestions to improve the nature outlook. In the context scenarios trends in food production and energy supply were updated by expert judgement. Updating these trends by model calculations would make it possible to quantify them and would thereby be helpful to better test the policy scenarios in different circumstances, defined by the context scenarios.

Besides, more attention could have been paid to the design activities. It would be easier for policymakers and stakeholders to imagine the policy scenarios if they were more visualized by showing more concrete situations of how nature might look like (e.g. by making sketches or manipulated photographs), by providing more symbolic representations of land-use by nature, and by showing the differences with the present situation more explicitly.

Furthermore, the methodology for deriving policy recommendations from the policy scenarios could be further elaborated. This was more or less done in an ad hoc way. Doing this in a more systematic way could be helpful not only for the scenario team but also for the policymakers and stakeholders who want to derive more recommendations from the scenarios by themselves.

References

Asselt, M.B.A. van, J. Mesman and S. van 't Klooster, 2007. Dealing with prognostic uncertainty, Futures, 39, pp. 669-684.

Becker, H.A., D. van Houten and J.T.J.M. van der Linden 1982. Handleiding voor het ontwerpen van scenario's. [Manual for making scenarios.] Utrecht, Utrecht University.

Bolman, B.C. and D.G. Goldsborough, 2011. Marine governance. Wageningen, IMARES part of Wageningen UR.

IKR, Ministery of, 2005. Toekomstverkennen. [Exploring the future.] Den Haag, Ministry of the Interior and Kingdom Relations.

CPB, NEAA and NISR, 2006. Welvaart en leefomgeving. [Welfare, prosperity, and quality of the living environment.] Den Haag / Bilthoven. CPB Economic Policy Analysis / Netherlands Environmental Assessment Agency / Netherlands Institute for Spatial Research.

Dammers, E., 2000. Leren van de toekomst. [Learning from the Future.] Delft, Eburon.

Dammers, E., 2010. Making territorial scenarios for Europe. Futures, 42, pp. 785-793.

Heijden, K. van der, 1996. Scenarios. Chichester, John Wiley & Sons.

Klijn, J., 2011. Wisselend getij. [Changing tide.] Wageningen, Alterra part of Wageningen UR.

Kuiper, R. and D. Evers (red.) Ruimtelijke opgaven in beeld. [View on territorial challenges.] Den Haag, PBL Netherlands Environmental Assessment Agency.

PBL, 2010. Balans van de leefomgeving. [Assessment of the Living Environment.] Den Haag, PBL Netherlands Environmental Assessment Agency.

PBL 2011. Natuurverkenning 2010 – 2040. [Nature Outlook 2010 - 2040.] Den Haag, PBL Netherlands Environmental Assessment Agency.

Reijnen, R., A. van Hinsberg, W. Lammers, M. Sanders and W. Loonen, 2007. Optimising the Dutch National Ecological Network. In T.M. de Jong, R. Posthoorn and J. Dekker. (eds.) Landscape ecology in the Dutch context: nature, town and infrastructure. Utrecht. KNNV.

Schwartz, P. 1991. The art of the long view. New York. Double Day.

Stegeman, H., D. Piljic, A. Struijs and E. Versteegh, 2011. In 2030. Schiedam, Scriptum.

Stiglitz, J., 1988. Economics of the public sector. New York, Norton.

Sijtsma, F. J., Farjon, H., S. van Tol, A. van Hinsberg, P. van Kampen and Arjen Buijs (in press). Evaluation of landscape changes - Enriching the economist's toolbox. In W. Heijman, and C. M. J. van der Heide (Eds.), Landscape Economics. London, Routledge.

Verburg, R., A. Gerritsen and W. Nieuwenhuizen, 2011. Casuïstiek en bestuur in de Natuurverkenning. [Casuistic and Administration in the Nature Outlook.] Wageningen / Den Haag. Alterra part of Wageningen UR / LEI part of Wageningen UR.

Wack, P., 1985. Scenarios: shooting the rapids. Harvard Business Review, 1985 (6), pp. 139-150.

Wieringa, K. and R. van Oostenbrugge, 2010. ‘Vloek of zegen? Herijking van het natuurbeleid’. [Curse or Blessing? Reconsideration of Nature Policy.] Landschap: 227-232.

Wright, G. and P. Goodwin (red.), 1998. Forecasting with judgement. Chichester, John Wiley & Sons.

WRR, 2010. Uit zicht. [Out of view.] Amsterdam, Amsterdam University Press.