

Indicators for the 'Convention on Biodiversity 2010'

Public awareness and participation

B.H.M. Elands
C.S.A. van Koppen

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B.H.M. Elands

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Summary

The Streamlining European 2010 Biodiversity Indicators (SEBI2010) project was developed to guide the development of a framework of biodiversity indicators at the European Level. One of the focal areas of this framework is public opinion. The headline indicator in this area is public awareness and participation. This report aims at elaborating this headline indicator.

On a global, European and Dutch national level of biodiversity policy, the importance of public awareness and participation is underlined by analysts and policy makers. At the global level, the most important process for indicator development is the elaboration of the biodiversity indicator set by the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA). In this elaboration process, however, the development of indicators for public awareness and participation is seriously lagging behind indicator development in most other focal areas. Also at the European level clear guidelines for indicators are still lacking. Against this backdrop, this report describes the development of an indicator framework on base of literature research, survey findings in the Netherlands and abroad, and practical considerations of feasibility.

Public awareness is defined as '*awareness of the importance of, and the measures required for biodiversity conservation*'. In view of the general level of public understanding of biodiversity, however, this concept is made operational as *awareness of the need for nature protection*. Public participation is conceptualized as '*nature related activities of people within the domains of conservation, consumption, and politics*'. In each of these domains, a more active and a more passive sub-indicator is selected. Sub-indicators for participation include: membership of nature protection organizations, volunteer work for nature and landscape conservation, interest in information about nature, visits to nature and forest areas, priority for nature in government policy, and participation in nature policy decision-making.

In sum, the present headline indicator demonstrates that public awareness of the need for nature protection is high and public support and public participation remains fairly strong.

Tendencies in awareness and participation are still difficult to predict but appear to be negative rather than positive. Public awareness of the need for nature protection has decreased since 2001. Participation within the domain of conservation is large and has increased significantly since 1990. Participation within the domain of consumption is large, but the number of visits to nature and forest areas decreased since 1992. Participation within the domain of politics is uncertain, as the priority for nature in government policy has also decreased since 2001.

A significant, positive, and fairly strong correlation between the level of awareness and the degree of participation is found among all sub-indicators, with the exception of volunteer work. A relatively high level of volunteer work is found in both low awareness and high awareness groups.

The proposed headline indicator does a fair job in mapping awareness and participation with regard to nature conservation. Compared to the aims and policies set out in the CBD process, however, several aspects are still missing:

- The present headline indicator is not specific to biodiversity. Given the present (low) general state of biodiversity awareness, it may not be useful to include questions on biodiversity *per se* in public surveys. In line with the CBD process, however, awareness of

biodiversity, of its meaning for human well-being, and of the measures needed for its conservation need to be further promoted. More specific biodiversity related indicators would be useful for monitoring progress towards this goal;

- In using nature as a proxy for biodiversity, some particular aspects of biodiversity are neglected. This is, among others, the case for agro-biodiversity. From the viewpoint of CBD and EU biodiversity policy, it would be interesting to include indicators for public awareness and participation with regard to agro-biodiversity. It is not clear, however, how such an indicator can be made operational;
- In line with the CBD process, it would be useful to develop not only indicators for public awareness and participation, but also for government's and society's capacity of communicating, educating, and facilitating participation. Such indicators would be particularly relevant to stimulate and monitor activities by government and civil society for promoting biodiversity awareness and participation.

1 Introduction

1.1 Problem statement

Monitoring biodiversity for people, people for biodiversity

Conservation and sustainable use of biodiversity is an important global policy objective. The international framework for biodiversity policy is set in the Convention on Biological Diversity (CBD), which originated from the UN Conference on Environment and Development in Rio de Janeiro, 1992. While the CBD described the main principles and decision making procedures for conservation and sustainable use of biodiversity, its policy has been elaborated in the Conference of the Parties (COP) to the CBD, The 6th meeting of the COP adopted the Strategic Plan for the CBD. In its mission statement, Parties committed themselves to achieve by 2010 a significant reduction of the current rate of biodiversity loss. This so-called '2010 target' was subsequently endorsed at the Johannesburg Summit of 2002. In order to monitor progress towards this worldwide commitment a first set of indicators was adopted under the CBD.

Focal area 'status and trends of the components of biological diversity'

- Trends in abundance and distribution of selected species
- Change in status of threatened and/or protected species
- Trends in extent of selected biomes, ecosystems, habitats
- Trends in genetic diversity of domesticated animals, cultivated plants, fish species of major socioeconomic importance
- Coverage of protected areas

Focal area 'threats to biodiversity'

- Nitrogen deposition
- Numbers and costs of invasive alien species
- Impact of climate change

Focal area 'ecosystem integrity, goods and services'

- Marine trophic index
- Connectivity/fragmentation of ecosystems
- Water quality in aquatic ecosystems

Focal area 'sustainable use'

- Area of ecosystems under sustainable management (forest, agriculture, fishery, aquaculture)
- Ecological footprint of European countries
- *Focal area 'status of access and benefits sharing'*
- Percentage of European patent applications for inventions based on genetic resources and/or traditional knowledge that disclose the source of these resources and knowledge

Focal area 'status resource transfers and use'

- Funding to biodiversity in economic and development cooperation and EU research, monitoring and management

Focal area 'public opinion'

- Public awareness and participation

Figure 1.1. Overview of European biodiversity headline indicator framework (source: SEBI2010 Coordination Team, 2005b)

This political ambition at global level is at European level accompanied by a growing need for 'structured European coordination of biodiversity monitoring, indicators, assessment and reporting efforts, with a long-term perspective and sound funding basis' (SEBI2010 Coordination Team, 2005a: 3). Therefore, a specific project called Streamlining European 2010 Biodiversity Indicators (SEBI2010 project) was developed to guide the process on a European Level¹. The SEBI2010 project elaborated a final framework of biodiversity indicators. This framework consists of 16 headline indicators, which are grouped in focal areas (Figure 1.1). The focal areas cover different subjects with respect to the environment, resource use and society. The first four focal areas are defined by the CBD, the last three focal areas by the EU. Each focal area distinguishes one or more headline indicators.

The Netherlands Environmental Assessment Agency² is responsible for developing and reporting on the present state-of-the-art of the EU Biodiversity Indicators in the Netherlands.

Public awareness and participation

This research will focus exclusively on the headline indicator 'public awareness and participation'. Whereas for almost all other headline indicators the SEBI2010 project teams have finished the review process, a scoping paper on this issue is at present not yet available. A scoping paper was announced by the Coordination team in 2006 (SEBI2010 Coordination Team, 2006), but at the recent meeting of 18-19 January (SEBI2010 Coordination Team, 2007):

- The scoping paper was not mentioned anymore;
- The Coordination Team proposed a single indicator for inclusion, i.e. 'number of visits to nature reserves';
- It was commented that *'It will be explored whether an indicator based on membership of voluntary bodies, or participation in voluntary work could be included'*.

We can conclude that, on the state-of-the-art of the indicator 'public awareness and participation' in the SEBI2010 process, no theoretical and empirical progress has been made. Also, the status of this indicator remains vague. Moreover, it seems to be unclear which targets have to be achieved by individual countries.

Consequently, in this research we will elaborate the indicator 'public awareness and participation' theoretically, develop a set of indicators, and verify these indicators for the Netherlands. Moreover, we will examine our results with respect to global, European and Dutch policy aims.

Criteria for review of indicator

The Coordination Team has developed thirteen criteria for the review of each indicator (Figure 1.2). They build on existing indicator criteria used for the EEA core set of indicators and the CBD national level indicators. The first ten apply to each indicator, the last three apply to the set of headline indicators.

¹ Information on the SEBI2010 project is available at: <http://biodiversity-chm.eea.europa.eu/information/indicator/F1090245995>

² See www.mnp.nl

Criteria for review of indicator

1. *Policy relevant and meaningful:* The indicator shall be policy relevant, especially towards the 2010 target. It shall send a clear message at a level appropriate for policy and management decision making. It shall be meaningful on a regional level.
2. *Biodiversity relevant:* The indicator shall be relevant for biodiversity.
3. *Scientifically sound and methodologically well founded:* Clear description of methodology used. The indicator may be used in other indicator initiatives also.
4. *Progress towards target:* The indicator shall show progress towards the 2010 target.
5. *Broad acceptance and understandable:* The indicator shall be easy to understand and to document.
6. *Affordable monitoring, available and routinely collected data:* Also ensures that indicator can be updated regularly.
7. *Affordable modelling:* Information on cause-effect relationships should be achievable and quantifiable.
8. *Spatial and temporal coverage of data:* Data should be consistent in space and cover all or most of EEA countries. See Annex I for a list of countries. Sufficient/insufficient time trends.
9. *National scale and representativeness of data:* The indicator should apply to the national and relevant supra-national scale and not be developed at site scale.
10. *Sensitive:* Indicator should be able to detect changes in systems in timeframes and on the scales that are relevant to the decisions, but also be robust so that measuring errors do not affect the interpretation.
11. *Representative:* The set of indicators provides a representative picture of the DPSIR (?) chain.
12. *Small number:* The smaller the total number of indicators, the more communicable they are to policy makers and the public and the lower the cost.
13. *Aggregation and flexibility:* Aggregation should be facilitated at a range of scales.

Figure 1.2 Criteria for review of indicator (Source: SEBI Coordination Team, 2006)

1.2 Research design

This project has the following aims:

- To give insight into the policy of the CBD and EU with respect to the headline indicator 'public awareness and participation';
- To develop the indicator 'public awareness and participation';
- To assess the current state and the trend in the Netherlands on the basis of existing and available data;
- To give insight into the extent to which the indicator development and analysis is consistent with the EU and CBD biodiversity policy.

The research design follows closely the four aims and consists of four phases. We will describe them subsequently.

1. Policy analysis

We will analyse which policy views and targets that are set for the headline indicator 'public awareness and participation' by the CBD, EU, and the Netherlands. Our main sources of information are policy documents, mainly derived from CBD-, EU- and Dutch ministry websites.

2. Indicator development

In this phase, we conceptualize the indicator, on base of the previous phase and other scientific considerations. We will define a limited number of sub-indicators, that are able to highlight the most important aspects of the headline indicator, and present a conceptual framework incorporating the sub-indicators.

3. Indicator analysis

In this part of the study we will present the current state and the historical trend of the headline indicator and sub-indicators. Our main sources are research data, administrative data and national statistics.

4. Indicator policy analysis

In this part of the research we will further explore and discuss the results of the indicator analysis. Since there are no specific targets set for public awareness and participation in the CBD process or by the EU, it is not possible to evaluate the progress toward such targets. We will, however, reflect on current trends in awareness and participation and on ways to improve the headline indicator.

Relations with other projects

Our project is linked to the research project 'Maatschappelijk draagvlak natuur' (Public support for nature) by Overbeek *et al.* (2007). This research project is the successor of two previous 'public support for nature' research projects conducted in 1996 and 2001 (Buijs & Volker, 1997; De Boer & Schulting, 2002).

It is also linked to the working group 'public attitudes to biodiversity and its conservation' of the ALTER-Net project. ALTER-Net stands for 'A Long-Term Biodiversity, Ecosystem and Awareness Research Network. It is a partnership of 24 organizations from 17 European countries and it aims to help deliver on the CBD 2010 target (Buijs *et al.*, 2006)³.

Limitations of this project

The headline indicator 'public awareness and participation' is relatively new and undeveloped as yet. This means that little policy attention has been given to it and that it is only limited elaborated both theoretically and empirically. These facts, combined with the limited time available for this research, imply that the report offers a first step in developing the headline indicator, rather than a full-fledged indicator framework. We hope, however, that this report will contribute to the (inter)national debates on involvement of broad groups of citizens in biodiversity conservation.

1.3 How to read this report

In Chapter 2 the policy context at the global, the European and the national level is explored. We will consider possible implications of policy debates for the CBD-headline indicator 'public awareness and participation'. In Chapter 3 the structure of the headline is elaborated into a conceptual framework, which is theoretically and operationally adequate. Chapter 4 assesses the present state and the historical trend of the headline indicator and sub-indicators in the Netherlands. In Chapter 5, we further analyze specific aspects of the reports findings. Chapter 6 provides the conclusions, compares the results to other countries, and discusses the quality of the headline indicator and ways to improve this quality.

³ Information on the ALTER-Net project is available at www.alter-net.info

2 People and biodiversity policy

2.1 Global policy

In this chapter we will describe key aspects of the policy context for developing public awareness and participation indicators. A proper starting point is the global policy level of the CBD. As was mentioned above, the principles of the CBD are elaborated into more concrete policy recommendations and measures by the Conference of the Parties (COP), on subsequent meetings, the 8th of which took place in 2006. A second important global CBD body is the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), which supports the elaboration of the CBD with scientific guidelines and advices. With regard to indicators for public awareness and participation, three processes on the global policy level are of particular relevance: the elaboration of measures for public awareness and education; the elaboration of measures for participation; and the elaboration of an indicator set by the SBSTTA. We will briefly describe these processes in this section. For further information on the global CBD process, we refer to the CBD site (www.biodiv.org) and the CBD Handbook (Secretariat of the CBD, 2005). We do not take into consideration the 'people and biodiversity' policy of other global organizations, such as UNESCO and OECD.

Elaboration of measures for promoting public awareness and education within the CBD framework (a)

Public awareness and education are explicitly addressed in Article 13 of the Convention, which summons the contracting Parties to promote *'understanding of the importance of, and measures required for the conservation of biodiversity, through media and inclusion in educational programmes, and to cooperate internationally in developing educational and public awareness programmes'*.

This article has been elaborated in subsequent meetings of the COP. In 2006, COP 8 addressed education and awareness prominently in Decision 6 on *'The Global Initiative on Communication, Education and Public Awareness: overview of implementation of the programme of work and options to advance future work'*. Priority action 2 under this decision is: *'Assess the state of knowledge and awareness on biodiversity and determine capacity for communication'*. This purpose of assessment is to establish a baseline understanding of the state of awareness among key audiences (including, inter alia, general public, youth, local communities and the business sector) through a variety of research tools (including focus groups, surveys, press clippings research). The assessment should address the following elements, *inter alia*:

- Awareness of Biodiversity and its relationship to human well-being;
- Awareness of the 2010 biodiversity target and CBD processes;
- Capacity of Parties to communicate biodiversity messages.

Elaboration of measures for facilitating effective participation of local communities and other stakeholders (b)

Compared to awareness and education, public participation is much less elaborated in the Convention. In several COP meetings it is mentioned as a condition for implementation (e.g. in decisions on biodiversity conservation in marine and coastal areas). For the purpose of indicator development, the most important procedure with regard to participation may well be the so-called Ecosystem Approach. This approach is seen as the most appropriate strategy to

balance biodiversity management and sustainable use in an equitable way. The Ecosystem Approach, among others, calls for decentralization of management to the lowest appropriate level, arguing that *'the closer management is to the ecosystem, the greater the responsibility, ownership, accountability, participation, and use of local knowledge'*.

COP 7, in Decision 11 recommends that *'Parties and other Governments facilitate the full and effective participation of indigenous and local communities and other stakeholders and continue or start implementation of the ecosystem approach'*.

Elaboration of a biodiversity indicator set by the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) of the CBD (c)

Developing a set of core biodiversity indicators is one of the major projects of the SBSTTA. The core set is based on the aforementioned Ecosystem Approach. It is meant to assist Parties and other Governments in designing or improving their national monitoring programmes and to streamline the provision of information for global biodiversity reporting (e.g. Global Biodiversity Outlook). The principles for choosing indicators, identified in this process, should also guide the development of indicators for assessing and communicating progress towards the 2010 target (COP 7, decision 30). The development of headline indicators, which is central to this report, is in fact part of this process of elaborating a global indicator framework (CE & UNEP, 2006). Awareness and education are mentioned in some of the contributions to the elaboration of the SBSTTA indicator framework, but no specific guidelines for indicators for awareness, education, or participation are provided in key documents of SBSTTA, neither in general guidelines for the design of indicators (SBSTTA, 2003a), nor in guidelines specific to the 2010 target (SBSTTA, 2003b).

While the SBSTTA process is most relevant with regard to development of indicators, it does not as yet provide direct guidelines for elaboration of indicators for public awareness and participation. Indirectly, however, indications of the purpose of such indicators can be derived from the processes (a) and (b). Given the prominent attention to assessment of public awareness and education, and the emphasis on the Ecosystem Approach, it may be expected that on a global level these processes in particular will guide the future elaboration of such indicators. Anticipating on future SBSTTA guidance, we may expect that parameters to monitor with regard to public awareness and participation will include:

- Public awareness of biodiversity and its relationship to human well-being;
- Awareness of relevant stakeholders of the 2010 biodiversity target and CBD processes;
- Capacity of the Dutch government to communicate biodiversity messages with relevant stakeholders;
- Effective participation of local communities in biodiversity conservation and sustainable use.

2.2 European policy

As was explained in the introduction, the development of indicators for public awareness and participation is part of the Streamlining European 2010 Biodiversity Indicators (SEBI2010) project, which constitutes the direct policy context for this report. The Aarhus Convention provides an additional process with relevance to public awareness and participation on the European policy level. We will briefly describe both processes.

The SEBI2010 project (a)

Within Europe, two policy levels are particularly relevant to the development of indicators (CE & UNEP, 2006):

- The 2003 Ministerial Conference on Environment for Europe requested, in the 'Kyiv Resolution on Biodiversity' for a core set of biodiversity indicators and a programme on biodiversity monitoring and reporting (Kyiv resolution on biodiversity) to be developed through the Pan-European Biodiversity and Landscape Conservation Strategy (PEBLDS);
- At the EU level both the European Parliament and the Council requested the Commission to report regularly upon the status of nature and biodiversity within the Union and the progress of Community policies in this area. The EU Council in 2004 endorsed the 2010 target of the CBD and the proposed headline indicator set.

Both levels are represented in the SEBI2010 project. This project is coordinated by a team consisting of representatives of the European Environment Agency (EEA), the European Centre for Nature Conservation (ECNC), the UNEP-World Conservation Monitoring Centre (UNEP-WCMC), the DG Environment, the PEBLDS Joint Secretariat and the chairs and coordinators of six expert groups. The Coordination Team of SEBI2010 is responsible for the development of the headline indicators. Most of the headline indicators are similar to the indicators adopted by CBD for immediate testing or further development and also adopted by PEBLDS Council for use at the pan-European level. The headline indicator on public awareness and participation, for the focal area of public opinion, however, was added to the EU headline list (see Figure 1.1). The Coordination Team has suggested that '*membership of environmental organizations*' and the '*Eurobarometer on the attitudes of Europeans towards the environment*' could be used to operationalize 'public awareness and participation' (Progress Report SEBI2010 Coordination Team, 15 November 2005: page 12). As yet, no further central guidelines are elaborated for the headline indicator(s) for public awareness and participation. It seems individual countries take the lead in this process.

The Aarhus Convention (b)

Additionally to the aforementioned process, the Aarhus Convention may be relevant for Europe with regard to public awareness and participation. This Convention, adopted in 1998 by the United Nations Economic Commission for Europe (UNECE), grants three fundamental rights to the public and the associations representing it: access to information; public participation in the decision-making process; and access to justice. It specifically deals with two major issues regarding transparency: the genetically modified organisms issue and information on the emission and transfer of pollutants. However, it can also be brought to bear on other issues of biodiversity conservation. This would imply that assessments - on base of proper indicators - are needed with regard to:

- Access to relevant regulation and data (e.g. concerning regulation for Natura 2000 areas);
- Public participation in decision-making processes (e.g. procedures for consultation and timely information).

2.3 Dutch policy

As a follow-up to the Dutch ratification of the CBD, the responsible ministries in 1995 issued a common Biodiversity Action Plan (in Dutch: '*Strategisch Plan van Aanpak Biologische Diversiteit*'). The plan consisted of an analysis of existing policies, to see if the Netherlands complied with the Convention, and a list of goals and actions concerning biodiversity. The Plan

concluded that, formally, the Netherlands already complied with the Biodiversity Convention by virtue of its existing policies. Responding to the spirit of the Convention, however, it stated a commitment to initiate or strengthen particular policy strategies. We may summarise these strategies as follows (Van Koppen, 2002):

- More attention to biodiversity conservation outside the National Ecological Network (the Dutch network of protected nature areas);
- More attention to invisible species (the so-called cryptobiota), to life support functions, and to sustainable use of biodiversity;
- More attention in international policy to cooperation in biodiversity management;
- Increased monitoring of and scientific research on biodiversity, within a global perspective;
- Attention to public involvement and participation with regard to biodiversity.

Biodiversity policy thus was defined as a policy that largely overlapped with existing policies on nature conservation, environmental protection, and development cooperation, but that also asked for a number of additional actions. Public involvement and participation was one of the actions that, responding to the spirit of the convention, needed strengthening.

Public awareness and participation were also highlighted in the 1998 evaluation of the Biodiversity Action Plan, which strongly recommended to *'give priority attention to active communication with and participation of groups in society, both in determining and in operationalizing policy views. Participation and societal engagement should not (or not only) be a separate theme, but should be built into the whole policy as a strategic line'* (Romijn *et al.*, 1998: 6; Van Koppen, 2002).

The need for public participation is underlined in the Dutch nature policy plan of 2000 and even expressed in the title: 'Nature for people, people for nature'. At the European Nature Conference 2005 in Apeldoorn the importance of participation was stressed in the so-called 'Apeldoorn Appeal'⁴, undersigned by many Dutch and European nature conservation organizations. At this conference, the then minister of Agriculture, Nature Management and Food Quality Veerman underlined the need for societal engagement. In current nature policies, however, policy instruments and financial resources for stimulating public awareness and participation are limited. Moreover, current policies address the issues of participation and awareness mostly within the context of nature protection in general, but hardly with explicit reference to biodiversity in particular. Explicitly, biodiversity policy is mainly elaborated in the context of international policy, in particular within the International Policy Programme on Biodiversity (2002-2006).⁵ This programme, however, does not address the issue of public awareness and participation among Dutch citizens, except with regard to environmentally responsible business.

Nonetheless, it is worth mentioning that recently some interesting projects directed at public participation in biodiversity protection have been initiated by both the Ministry of Agriculture, Nature Management and Food Quality and the Ministry of Housing, Spatial Planning and the Environment. These initiatives include, among others, projects for conservation and sustainable use of agro-biodiversity, a broad participatory project for biodiversity conservation in the 'Hoeksche Waard' ('Biodiversiteit Hoeksche Waard voor en door burgers') and an initiative on providing information on biodiversity conservation to citizens through internet⁶

⁴ See <http://www.natureconference.org>

⁵ See <http://netherlands.biodiv-chnm.org>

⁶ See <http://www.biodiversiteitgeeftjelevenkleur.nl>.

2.4 Conclusion

On each of the policy levels reviewed in this chapter, i.e. the global, the European, and the Dutch national level of biodiversity policy, the importance of public awareness and participation is strongly underlined by analysts and policy makers. Practical implementation of measures for promoting awareness and participation, however, is limited. Accordingly, the development of indicators for public awareness and participation is seriously lagging behind indicator development in most other focal areas.

Against this backdrop, it makes good sense that the SEBI2010 project has included a focal area of public opinion, with indicators for public awareness and participation in its set of headline indicators. Quite probably, this initiative may be taken over by the SBSTTA in the near future. However, since the development of measures and of indicators in this focal area is at so early a stage, clear guidelines for indicators are still lacking. This implies that indicator development to a large extent will be a bottom-up process, in which out of the current experiences in different European countries a more general approach to awareness and participation indicators can emerge.

From the analysis presented, it appears that the following issues relevant to public awareness and participation would in principle be worth monitoring on base of indicators:

1. *The state of awareness and participation of the general public or more specific stakeholder groups:*
 - Awareness of biodiversity and its relationship to human well-being;
 - Awareness of the 2010 biodiversity target and the CBD processes;
 - Participation in practical actions for biodiversity conservation and sustainable use;
 - Participation in policy decision making concerning biodiversity.
2. *The capacity of the government and its actual measures for promoting public awareness and participation:*
 - Capacity to communicate biodiversity messages;
 - Facilitation of participation in decision making, conservation, and sustainable use;
 - Transparency and access to information in biodiversity policies.

In line with the priorities of the SEBI2010 project and the characterization of the focal area as 'public opinion', this report will neither elaborate indicators concerning government capacity and measures nor deal with more specific stakeholder groups. A consequence of the latter is that in elaborating awareness indicators, it will not focus on awareness of the 2010 biodiversity targets and CBD processes, as this awareness is largely absent among broader categories of the public, and appears to be mostly of importance to specific stakeholder groups (e.g. NGOs and governmental bodies).

The focus of the rest of this report, therefore, is on the general public and its awareness of biodiversity in relation to human well-being, participation in concrete actions for biodiversity conservation and sustainable use, and participation in policy decision making concerning biodiversity.

3 Public awareness and participation: indicator development

3.1 Biodiversity: what is it about?

Before we will focus on the concept of public awareness and participation, we will first consider the term biodiversity.

In the Convention on Biological Diversity, article 2, biodiversity is defined as ‘the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems’ (Secretariat of the CBD, 2005: 5). The term biodiversity refers to the totality of species, populations, communities and ecosystems, both wild and domesticated. In this broad sense, it conveys a similar meaning as ‘nature’. However, it specifically includes cultural modifications of the natural world (Dassman, 1991).

The relationship between ‘biodiversity’ and ‘nature’ is schematically represented in Figure 3.1. If we compare the meaning of biodiversity outlined in the CBD and the common understanding of the word ‘nature’ when used in a context of nature conservation, there is a large overlap between the terms (segment A). There are, however, also aspects that are important to biodiversity conservation, but have little significance in nature conservation (segment B). This is particularly the case for the diversity of domesticated and cultivated species and varieties, which is, among others, preserved in gene banks, and also receives increasing attention in *in situ* protection of agro-biodiversity.⁷ As was observed in the previous section, biodiversity conservation in the Netherlands is to a very large part covered by nature policy, in particular by the nature areas and corridors of the National Ecological Network (Ministerie van Landbouw, Natuurbeheer en Visserij, 2000). The protection of agro-biodiversity, however, is not fully covered by existing nature policy frameworks, particularly where it concerns traditional Dutch agricultural animal and plant varieties, for instance of fruit trees, cattle, poultry, or arable crops (Ministerie van Landbouw, Natuurbeheer en Visserij, 2002).

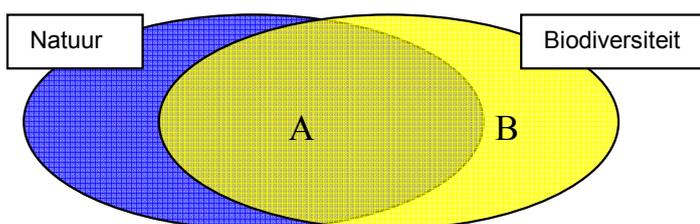


Figure 3.1. Overlapping meanings of the terms ‘biodiversity’ (*biodiversiteit*) and ‘nature’ (*natuur*)

This schematic characterization of biodiversity and nature is not to suggest that these concepts are clear-cut and unequivocal. On the contrary, their meaning is often diffuse and disputed. Differences in approaches to biodiversity are interrelated with the values people

⁷ It is worth noticing that, reversely, there are aspects of nature protection that have little significance to biodiversity conservation, as for instance the protection of unique geological formations such as the Grand Canyon, or, more modestly, the Heimansgroeve in the Netherlands.

attach to the protection of biodiversity. Kunin & Lawton (1996) distinguish five major motives for biodiversity conservation:

- Our ethical responsibilities for life on earth;
- The pleasure and cultural richness that species can bring us now or in the future (comparable to medieval cathedrals or Mozart's concerts);
- The actual and potential use of species (e.g. medicines, food);
- Ecosystem functions that are necessary for maintaining life support systems of our planet, as far as they are dependent on species diversity (including ecological resilience);
- Diversity of species as an indicator for sustainability.

In scientific and policy debates on biodiversity, we can roughly distinguish between 'broad' and 'narrow' interpretations. In 'narrow' interpretations, the emphasis often is on the value of biodiversity for actual and potential use, and as a condition for maintaining other life support functions of ecosystems. In broader interpretations, ethic and aesthetic values - as are central to the Arcadian tradition of nature appreciation - also play a major role (Van Koppen, 2002).

Among a wider public the term biodiversity finds little resonance. As was underlined in a recent survey under local residents and tourists near a Dutch National Park, Dutch citizens usually have heard of the term, but it hardly evokes concrete associations. For some, it even evokes feelings of aversion. As far as the term is positively interpreted, it is usually equalled to nature (Buijs *et al.*, 2006).

Obviously, what has been said about the diffuse and disputed character of the concept of biodiversity also, and even stronger, applies to the concept of nature. Within the scope of this report, it is impossible to enter the vast scientific, political, and philosophical debates on this subject. Focussing mainly on public perception of nature, however, some relevant observations can be made.

The perception and appreciation of nature by the Dutch public have been investigated in several studies. Within the framework of nature policy monitoring, three representative surveys have been done to investigate public support for nature and nature policy among the Dutch population (Buijs & Volker 1997, De Boer & Schulting 2002, Overbeek *et al.*, 2007). These surveys show consistently that a broad view of nature is predominant among the Dutch public. Not only nature reserves and wild animals and plants, but also agricultural landscapes and domesticated animals are considered to be part of nature. Nature is appreciated for a broad range of motives, including health, aesthetic enjoyment and ethical motives. This means that 'nature', as it is commonly perceived by the Dutch public, tends to be broader than nature defined in nature policy and includes at least to a large extent the culturally modified diversity that is also part of biodiversity.

This brief analysis of biodiversity has the following implications for the development of indicators for public awareness and participation concerning biodiversity. First, in monitoring awareness and participation it is, as yet, not useful to focus on the concept of biodiversity specifically, as this concept has no articulated meaning for most citizens. Second, both in policy and in everyday life, the concepts of nature and biodiversity overlap to a large degree. Third, the broad concept of nature, as is it shared by a majority of citizens, includes the component of culturally modified species, which is a typical aspect of biodiversity. For these reasons 'nature' appears to be the best available proxy for 'biodiversity' when monitoring public awareness and participation, presuming that we take on board a broad interpretation of biodiversity.

3.2 Public awareness and participation

Introduction

As a consequence of the analysis presented in Chapter 2 and the previous section, the rest of this report will focus on developing indicators for public awareness and participation with regard to nature.

Theoretically, the approach of this chapter is largely based on the approach of the most recent survey of public support for nature and nature policy in the Netherlands (De Bakker *et al.*, 2007). For further theoretical backgrounds, we refer to this publication.

The key considerations of our approach are:

- Awareness is operationalized in terms of problem awareness;
- Effective awareness is considered to be strongly interrelated with participation in practical activities;
- Practical activities are operationalized over three domains: protecting nature, using nature, and deciding for nature.

Public awareness

As described in the previous chapter, public awareness is addressed in Article 13 of the CBD as 'understanding of the importance of, and measures required for the conservation of biodiversity' and elaborated in the CBD process as 'awareness of biodiversity and its relationship to human well-being' and 'awareness of the 2010 biodiversity target and the CBD processes'.

Awareness of nature, as several authors have pointed out (e.g. Keulartz *et al.*, 2000), includes cognitive (knowledge), normative (moral) and expressive (emotional) aspects. In 'awareness of the 2010 targets and CBD processes', the cognitive aspect appears to be dominant. In the text of Article 13, however, and in the term 'awareness of biodiversity and its relationship to human well-being', it appears that awareness is not just a matter of cognitive knowledge, but also entails moral and emotional meanings. It refers not just to people knowing that there is a Convention on Biological Diversity and being able to list conservation measures, but rather to people attaching value to biodiversity and feeling the need for protecting it. In other words, awareness of biodiversity, as is central to the indicator development, refers to a set of beliefs that in sum perhaps best can be characterized as 'concern for biodiversity'. Or, taking nature as a proxy for biodiversity: 'concern for nature'.

Many studies have been published on how to measure concern for the natural environment. Dunlap *et al.* (2000), for instance, have done so by designing a standard scale for what they call the New Environmental Paradigm (NEP). The NEP refers to a set of basic beliefs about the nature of the earth and humanity's relationship with it. It is measured on base of the response to statements such as 'the so-called ecological crisis has been greatly exaggerated', 'the balance of nature is very delicate and easily upset', and 'plants and animals have as much right as humans to exist' (Dunlap *et al.*, 2000).

Another approach, elaborated by Stern *et al.* (1998), analyzes environmental concern on base of four value orientations, taken from Schwartz: self-enhancement, self-transcendence, traditional and openness to change. They claim that environmental concern is mostly tied to the value orientation of self-transcendence (Stern *et al.*, *ibid.*).

Both approaches can produce scores with acceptable reliability. However, it is not clear how the approaches relate to each other and the theoretical bases of both are very much in debate.

In the Netherlands, public concern for nature has been measured, among others, in 3 large Dutch surveys on public support for nature conservation, carried out in 1996, 2001 and 2006, and published in 1997, 2002 and - forthcoming- 2007. The way in which concern for nature was operationalized in these surveys echoes the uncertainties of the scientific debate. In the 1996 survey on public support for nature conservation, 'fundamental attitudes' were measured on base of the NEP approach (Buijs & Volker, 1997). In the 2001 survey, a smaller set of more simple questions was used to tap public concern, or 'problem perception' as it was called. In the 2006 survey, this set is reused with small modifications, while in parallel, a public segmentation based on the value orientations of Schwartz is explored.

Until further research has shed more light on these issues, a rather pragmatic approach appears to be the most feasible way of developing an indicator for awareness. The set of the questions used in the 2001 and 2006 survey can serve as a base for monitoring concern for nature, or, as we will name it, 'awareness of the need for protecting nature'. It consists of the following questions, formulated as agree-disagree statements:

- I am concerned about the situation of nature in the Netherlands;
- Current attention to nature is excessive;
- We are over-worried about the future of nature in the Netherlands;
- The government spends too little money on nature conservation;
- Nature should not hinder economic progress.

An additional observation should be made on the name of the indicator. In the light of the debate on environmental concern, the concept 'awareness of biodiversity and its meaning to human well-being' seems unfit as an elaboration of public awareness as addressed in Article 13. Studies of environmental concern and the preamble of the CBD itself make clear that in addition to functions of biodiversity to human well-being, also rights of nature itself and religious or spiritual motives can be reasons for concern. Article 13, where it speaks of 'importance of, and measures required for the conservation of biodiversity importance of nature' appears to better include such reasons. Thus we will use 'awareness of the importance of, and measures required for the conservation of biodiversity' as principle concept for the awareness indicator, and operationalize this indicator, along the lines described, as 'awareness of the need for protecting nature'.

Public participation

A major issue in debates on theories on environmental concern is the relationship between environmental awareness and environmental behaviour. Although several studies have shown that correlations exist between environmental concern and self-reported environmental behaviour, the links between the two are rather weak (e.g. Dunlap *et al.*, 2000). Therefore, in dealing with environment-related behaviour, the focus of environmental sociology has been shifting from environmental beliefs and attitudes towards social practices. An argument for this shift is that routinized practices, embedded in social and physical contexts, exert more influence on the way people deal with environment than explicitly stated beliefs or values (Spaargaren, 2001; Shove, 2003). As this argument is also relevant to concern for nature, the 2006 public survey has done an effort to more explicitly incorporate practical activities. This effort has been adopted when developing an indicator for public participation in this report.

As a consequence, public participation as used in this report is much broader than citizen participation in nature policy and management processes. It includes a wide range of nature-related activities, ranging from watching a nature documentary to engaging in political action. Moreover, public awareness and public participation are considered to be closely interrelated. Participation in practical activities is not only of interest in its own right, but can also be used as an meaningful indicator for awareness, in addition to the indicator based on stated beliefs.

For the purpose of monitoring nature-related activities, three activity domains are distinguished, each with specific roots in the history of nature conservation (Van Koppen, 2002):

- *Nature conservation.* This domain comprises individual and group-wise activities for protecting nature in a broad sense. It includes practices such as making nature inventories, acting as a nature guide, voluntary nature management activities, taking care of nesting and feeding places for birds, being a member of nature protection organizations, et cetera. These activities emerged together with the rise of the nature conservation movement around 1900, and since the 1970s have spread substantially amongst the Dutch population;
- *Nature consumption.* This is the domain of consumption activities related to nature. It includes nature visits for walking and hiking, nature-oriented outdoor sports, and other forms of recreation in nature. Nature recreation, in a broad sense, has a long history in the Netherlands and in other Western countries. Since the first half of the 20th Century, nature recreation has become an explicit aim in nature policy and spatial planning. Other forms of 'nature consumption', such as watching nature documentaries, reading books and articles on nature, or buying eco-labelled food that is produced in a nature-friendly way, are also included in this domain;
- *Nature politics.* Since the institutionalization of nature policy from the 1970s on, public support of nature policy measures and participation in nature policy processes have become significant aspects of nature conservation. The domain of nature politics includes activities of citizens with regard to political decision making on nature, such as voting, participation in policy processes or engagement in political protest.

In all three domains it is not possible to identify indicators that cover the variety of activities included in the domain. In the 2006 public survey a limited set of items was included for each of the three domains. For the development of the indicators in this report, two items are selected per domain, on base of importance within the domain and data availability. In line with Veeneklaas *et al.* (1997: 16), who distinguished between active and passive support in analyzing public support for nature conservation, one 'passive' and one 'active' activity item was selected for each domain. This results in the following 'passive' (p) and 'active' (a) items, as indicators for public participation:

- Nature conservation
 - Membership of a nature protection organization (p)
 - Volunteer work for nature and landscape conservation (a)
- Nature consumption
 - Interest in information about nature (p)
 - Visits to nature and forest areas (a)
- Nature politics
 - Priority for nature in government policy (p)
 - Participation in nature policy decision-making (a).

3.3 Comparability with other countries

Neighbouring western European countries have reached some agreement with respect to this indicator. The English Department for Environment, Food and Rural Affairs has developed a baseline assessment for measuring progress regarding the 'Biodiversity Strategy of England'⁸. This baseline assessment distinguishes eight headline indicators. The headline indicator 'promoting education and public understanding' is the one which resembles 'public awareness and participation' the most. The aim of this headline indicator is: '*a society in which people recognise, value and take action to maintain and enhance biodiversity as part of their everyday lives – in the same way that they might address health issues, the community in which they live, or their economic circumstances*' (DEFRA, 2003: 113). In this statement a similar focus on practical activities is apparent, as was described in the previous section.

Indicators are:

- Number of visits to nature reserves in England;
- Volunteer time spent in conservation activity;
- Membership of biodiversity organizations.

Apart from these indicators, DEFRA has developed some other relevant indicators, which belong, however, to three other headline indicators:

- Public attitudes to biodiversity (awareness of phrase 'biodiversity', concern about loss of wildlife in UK, support of payments to farmers to protect wildlife);
- Public enjoyment of woodland in England (visits to woodlands);
- Ease of access to local green space and countryside in England.

The Flemish Institute of Nature Conservation is responsible to report on the state of nature in Flanders. In the Nature Report 2005⁹ (Dumortier *et al.*, 2005) the head indicator 'public awareness and participation' is operationalized as 'frequency of visits to forests and nature reserves' and 'membership of non-governmental organizations for nature conservation'.

Notwithstanding the lack of a common European framework for the headline indicator 'public awareness and participation' (see Chapters 1 and 2) it appears that there is some convergence in the elaboration of indicators in individual countries. Further exchange of information and views can help to stimulate the future process of development.

3.4 Framework for the indicator 'public awareness and participation'

The analysis so far results in the framework as presented in Figure 3.1. We define public awareness, in principle, as '*awareness of the importance of, and the measures required for biodiversity conservation*'. In view of the general level of public understanding of biodiversity, however, this concept is made operational as '*awareness of the need for nature protection*'. We conceptualize public participation as '*nature related activities of people within the domains of conservation, consumption, and politics*'. We further assume that public awareness and

⁸ <http://www.defra.gov.uk/wildlife-countryside/biodiversity/biostrat/indicators/index.htm>

⁹ http://www.inbo.be/content/page.asp?pid=BEL_NARA_NARA2005summary

public participation, thus conceptualized, are closely related to each other and together constitute an adequate headline indicator for people's effective concern for biodiversity.

Table 3.1. Conceptual framework for the headline indicator 'public awareness and participation'

PUBLIC AWARENESS	Awareness of the need for protecting nature		
PUBLIC PARTICIPATION	Domains of activities		
	<i>Conservation: protecting nature</i>	<i>Consumption: using nature</i>	<i>Politics: deciding for nature</i>
Passive	Membership of a nature conservation organization	Interest in information about nature	Priority for nature in government policy
Active	Volunteer work for nature and landscape conservation	Visits to nature and forest areas	Participation in nature policy decision-making

Summing up the argument presented in the chapters so far, the components presented in Table 3.1 constitute an adequate headline indicator for public awareness and participation, given the following criteria:

- The indicator should be in line with the global CBD process;
- The indicator should reflect present (social) scientific insights concerning biodiversity;
- The indicator should fit in with the SEBI2010 process and offer comparability with other European countries;
- The indicator should be realistic in view of the state of biodiversity awareness and participation of the public.

In addition to these criteria, indicator components were chosen that could be based on available research data and time series, since the research budget was limited.

4 Indicator analysis

4.1 Introduction

This chapter elaborates the set of sub-indicators. We will start with public awareness in section 4.2, which will be followed by public participation in section 4.3. General conclusions with regards to the headline indicator will be drawn in section 4.4.

Our main sources of information are:

- 'Milieu- en Natuur Compendium' (Environmental Data Compendium¹⁰ of the 'Milieu- en Natuurplanbureau', 'Centraal Bureau voor de Statistiek' and 'Wageningen Universiteit en Research Center' (Netherlands Environmental Assessment Agency, Statistics Netherlands and Wageningen University and Research Center);
- 'Dagtochtenonderzoek' (Day Trip Survey) of the 'Centraal Bureau voor de Statistiek' (Statistics Netherlands);
- Public support for nature research projects (Buijs & Volker, 1997; De Boer & Schulting, 2002; De Bakker *et al.*, 2007).

We refer to Appendix 1 for a more detailed description of the different sources of information.

4.2 Public awareness: its sub-indicator

As discussed in Chapter 3, for the CBD-indicator 'public awareness and participation' we operationalize public awareness as *'the awareness of the need for nature protection'*. On the basis of existing research (Buijs & Volker, 1997; De Boer & Schulting, 2002; De Bakker *et al.*, 2007), we operationalize this by means of 3 statements. Figures 4.1 and 4.2 display the results for the 2001 and 2006 research.

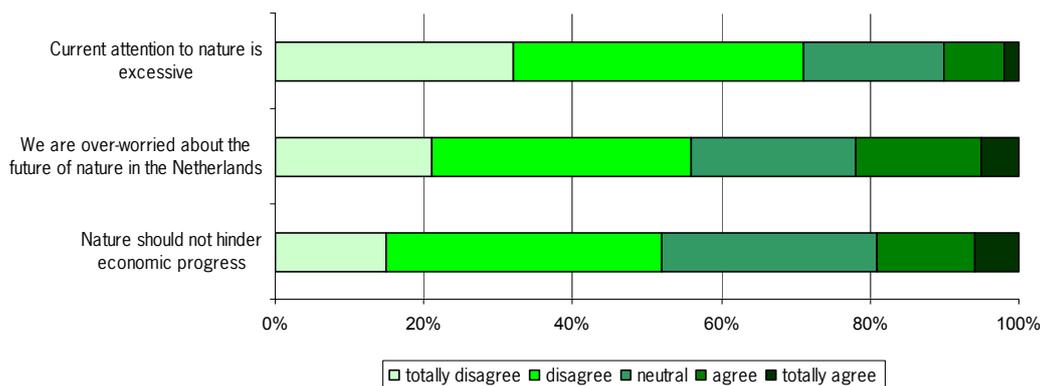


Figure 4.1. Awareness of the need for nature protection (N=1,551; %, people that answered 'don't know' are excluded from the analysis) (Source: De Boer & Schulting, 2002)

¹⁰ <http://www.mnp.nl/mnc/index-en.html>

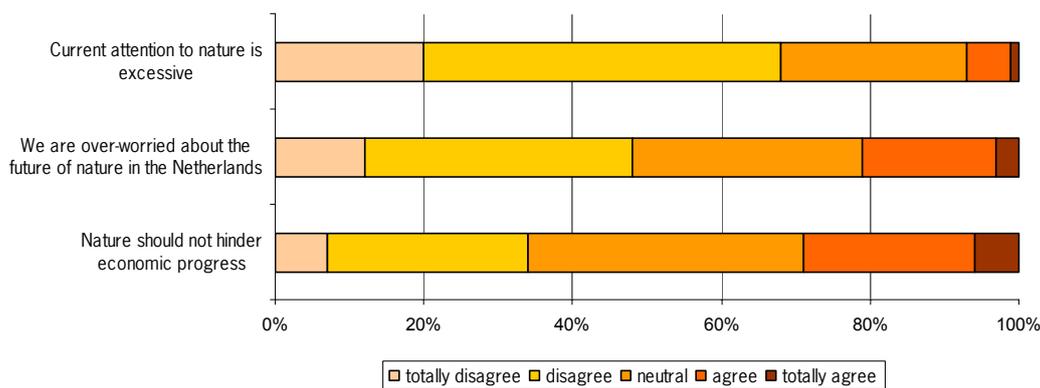


Figure 4.2. Awareness of the need for nature protection (N=1,485; % people that answered 'don't know' are excluded from the analysis) (Source: De Bakker et al., 2007)

We can see that most respondents think we do not pay *too* much attention to nature and that we *should* worry about the future of nature. However, the opinions change when the importance of nature is weighted against the importance of economy: a relatively small group of people, compared to the other two statements, disagrees with the statement that nature should not block economic progress.

Longitudinal analysis (Table 4.1) learns us that in 2001, compared to 1996, less people agree on the statement that society is paying too much attention to nature: 10% versus 24%. The same is true, although not completely comparable, for the over-worried statement. This seems to imply that nature has acquired an obvious position amongst Dutch citizens. However, we can observe that in 2006 compared to 2001, more people agree that nature should not hinder economic progress: 29% versus 19%.

Table 4.1. Public awareness: awareness of the need for nature protection (Source: Buijs & Volker, 1997; De Boer & Schulting, 2002; De Bakker et al., 2007)

Statement	(Totally) agree (%) ¹		
	1996	2001	2006
Current attention to nature is excessive	24	10	7
We are over-worried about the future of nature in the Netherlands	35 ²	23	21
Nature should not hinder economic progress	n.a. ³	19	29

¹ People that answered 'don't know' are excluded from the analysis

² Statement is somewhat different: 'we are over-worried about the condition of the environment'

³ N.a. = data not available

As these three items proved to be a reliable scale for the public awareness indicator (Cronbach's alpha = 0.63 for the 2006 research and 0.65 for the 2001 research), we used them to create three awareness groups¹¹:

¹¹ For each respondent, we have added the scores on the three statements and divided by 3. Respondents with more than one missing value are excluded from the awareness groups. High awareness: a score of less than 2.33; low awareness: a score of more than 3.33; medium awareness: a score between 2.33 and 3.33.

- Respondents with a *high* awareness of the need for nature protection;
- Respondents with an *medium* awareness of the need for nature protection;
- Respondents with a *low* awareness of the need for nature protection.

Figure 4.3 presents the results for 2001 and 2006. We can observe that in 2001 the high awareness group is much larger than in 2006. This difference is compensated for in the medium awareness group. The low awareness group stayed more or less equal.

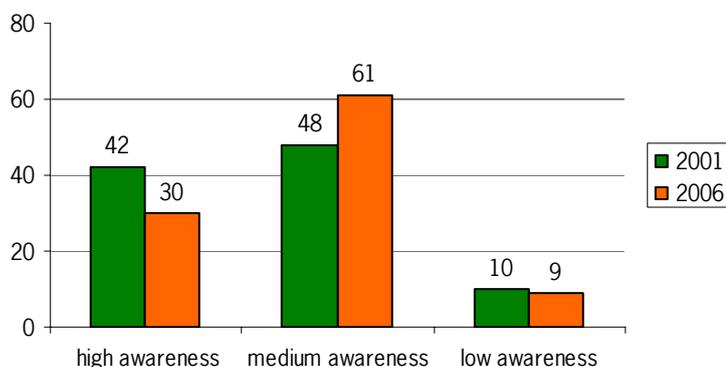


Figure 4.3 Public awareness of the need for nature protection in 2001 and 2006 (%)

4.3 Public participation: its sub-indicators

In the following, we will describe the participation level within the three domains of activities: protection, consumption and politics. Within each domain, we will start with the passive indicator and follow with the active indicator.

4.3.1 Conservation: protecting nature

Sub-indicator 1: Membership of nature conservation organizations

The majority of Dutch inhabitants have the opinion that the protection of nature by means of purchase and management is very important. Nature conservation organizations, such as *Natuurmonumenten* (Society for the Preservation of Nature Reserves in the Netherlands)¹² and *Provinciale Landschappen* (Provincial Nature Conservation Societies)¹³ play a major role in managing Dutch nature areas. Particularly in the 1990s, they have increased in popularity. In the period 1989 - 2005 membership numbers of *private nature conservation organizations* increased from 371,000 to 2,223,400¹⁴ (Figure 4.4).

The memberships of both regional and international oriented organizations seem to increase at the expense of national organizations. An example: *Natuurmonumenten*, active at national level, decreases, whereas the popularity of *Wereld Natuur Fonds* (WWF Netherlands) and the regional *Provinciale Landschappen* increases.

¹² www.natuurmonumenten.nl

¹³ www.landschappen.nl

¹⁴ www.mnp.nl/mnc, see also http://vroegevogels.vara.nl/portal?scr=news_newsitem1&id=236406

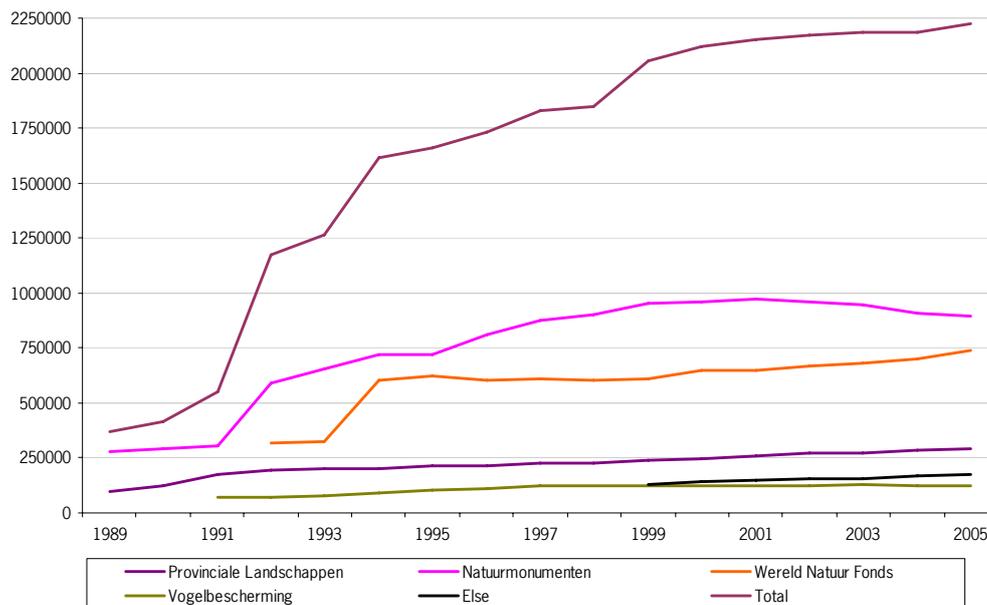


Figure 4.4 Membership numbers of Provinciale Landschappen, Natuurmonumenten, Wereld Natuur Fonds, Vogelbescherming Nederland and other organizations (Source: Netherlands Environmental Assessment Agency, Statistics Netherlands & Wageningen University and Research Center, 2007)

Sub-indicator 2: Volunteer work for nature and landscape conservation

Many people are involved in some sort of volunteering work regarding nature. Some people are active in keeping up small forest patches, other people take care about hiking trails, and again other people are involved in data collection. In this section, we will discuss volunteer numbers for nature and landscape organizations within the Netherlands¹⁵. Roughly, we can distinguish between three types of volunteer activities:

- Nature and landscape management;
- Nature observation;
- Nature education.

In the Netherlands, many groups are occupied with *nature and landscape management*. These groups are organized at different scales and levels, Most volunteers are connected to *Landschapsbeheer Nederland* (Landscape Management Netherlands)¹⁶, which saw its number of volunteers increase from ample 17,000 in 1993 to almost 30,000 in 2005. The large rise in 2005 is caused by the introduction of the *Natuurwerkdag* (Nature Labour Day), which is held on the first Saturday in November. In 2006, it attracted about 12,000 volunteers on 300 different locations throughout the Netherlands¹⁷.

Most of the nature and landscape management work takes place during weekends and holiday periods. In 2001, 21,904 volunteers put in a total of approximately 500 000 hours of landscape maintenance work (CBS *et al.*, 2003).

¹⁵ Data has been derived from the *Milieu- en Natuurcompendium* (Environmental Data Compendium), www.mnp.nl/mnc

¹⁶ www.landschapsbeheer.nl

¹⁷ www.natuurwerkdag.nl

A second group of nature and landscape management volunteers is involved in the management of meadow birds. The purpose of meadow bird protection work is to protect the birds' eggs. The greatest efforts to protect meadow birds take place in the province of Friesland in close collaboration with farmers. This group of volunteers, which is only partly connected to *Landschapsbeheer Nederland* (in 2005 almost 50%), is also growing: from ample 5,000 in 1993 to more than 12,000 volunteers in 2005.

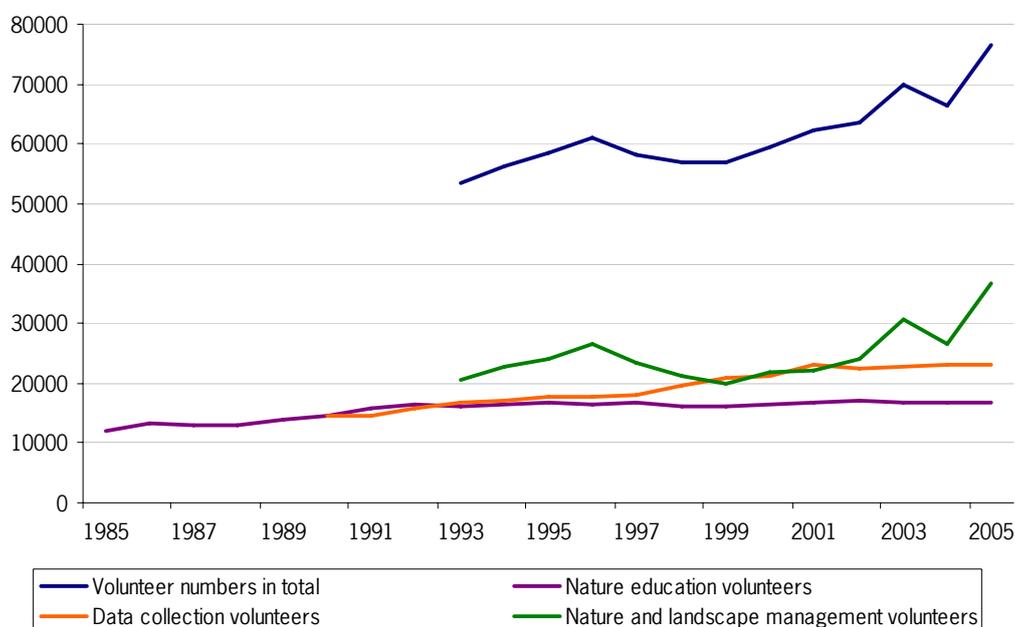


Figure 4.5 Membership numbers from 1993 to 2005 (Source: Netherlands Environmental Assessment Agency, Statistics Netherlands & Wageningen University and Research Center, 2007)

Nature observation is the second group of voluntary activities. Voluntary nature observers are active in data collection on distribution and abundance of flora and fauna. The *Vereniging Onderzoek Flora en Fauna* (VOFF, Society for Research into Flora and Fauna)¹⁸ is the platform organization in which twelve *Particuliere Gegevensbeherende Organisaties* (PGOs, Private Data Management Organizations) are organised. The number of volunteers has increased from almost 14,600 in 1990 to more than 23,000 volunteer recorders in 2005. These volunteers play an important role in the Dutch national inventory and monitoring of ecological data.

The final group of voluntary activities is *nature education*, such as organising excursions, courses, exhibitions and lectures. Many organizations are active in this field. The most important player is *IVN, Vereniging voor Natuur- en Milieueducatie* (Association of Environmental Education)¹⁹. In 1985, the IVN had about 12,000 members, in 2005 the number has grown up to 17,000 members. Since about 10 years, this number is pretty stable, but members are ageing.

In total, the number of volunteers for the abovementioned organizations has increased from 53,000 in 1993 to almost 77,000 in 2005. It should be noticed, that the total number of

¹⁸ www.voff.nl

¹⁹ www.ivn.nl

individuals doing volunteer work in these organizations is smaller, as one person can be active in more than one organization.

Compared to the total Dutch population volunteer numbers are relatively small. In the 2006 public survey (De Bakker *et al.* 2007), a broader set of voluntary activities has been explored. Especially activities that are easily applicable at home are frequently mentioned by Dutch people (32% puts nesting boxes or feeding boards in their garden and 18% plants regional trees, shrubs and other green around the house). Surprisingly, a large group of respondents (18%) clear other people's litter from nature areas.

4.3.2 Consumption: using nature

Sub-indicator 3: Use of information

People can be informed about biodiversity and nature through different kind of sources, such as television, a zoo or a nature excursion. The passive use of nature has been questioned by means of a variety of possible information sources (Table 4.2). In general, the far majority of all respondents (78%) have used one or more information sources during the last year (31% uses one, 26% two, and 21% three or more information sources). The most popular information sources are: zoos, magazines, books or article about nature and Internet.

Table 4.2 Use of information sources (other than television) about nature (source: De Bakker et al., 2007)

Information source	Use (%)
At least one information source (other than television)	78
Zoo	35
Magazine, book, article	34
Internet	28
Nature visitor centre	22
Children farm, school garden or of environmental education centre	19
Farm with agricultural nature	12
Nature excursion (with forester, farmer, and others)	6

Sub-indicator 4: Visits to nature and forest areas

Many Dutch people visit nature and forest areas. The Day Trips Survey of Statistics Netherlands (CBS) investigates the amount of day trips Dutch people take in one year. A day trip is defined as '*each recreational activity outside one's house that takes at least 2 hours*'. In 2001/2002, Dutch people made 935.8 million day trips, 14% of which (130.4 million) are outdoor trips. About 60% of these open air day trips take place in a nature area (76.5 million). Statistics Netherlands defined three types of nature destinations: dunes/beach/sea, forest/heath and lake/river/pond.

The Day Trip Survey was carried out in 1990/1991, 1995/1996 and 2001/2002²⁰. Figure 4.6 presents the amount of day trips for each nature destination type as well as in total. In the year 2001/2002, all nature areas in the Netherlands have drawn about 110 million day visitors a year. It seems that the number of day trips to nature areas has declined since the year 1991/1992.

²⁰ For more information about the Day Trip Survey, we refer to CBS Statline (<http://statline.cbs.nl/StatWeb/Start.asp?ip=Search/Search&LA=EN&DM=SLEN>), as well as to CBS- and NRIT-publications (CBS, 1992; NRIT, 2003a and 2003b).

The destination of half of the day trips is forest and heath areas. Main activities are walking, cycling and going for a drive. One quarter of the day trips takes place in and around rivers, lakes and ponds. Aquatic sports constitute the main activities, followed by 'sunbathing, swimming and having a picnic'. The third and final destination of day trips are the dunes, beach and sea. Main activities are of course 'sunbathing, swimming, having a picnic' and aquatic sports, but also walking and cycling.

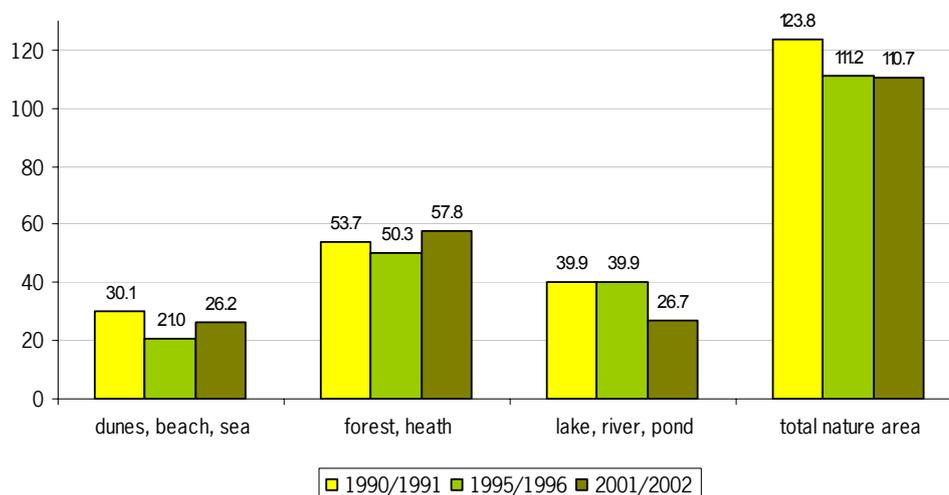


Figure 4.6 The number of day trips to nature areas in the Netherlands for different nature destinations (dunes/beach/sea, forest/heath, and lake/river/pond)²¹ in different years (in absolute numbers x million) (Source: CBS Day Trip Survey)

The Day Trip Survey, however, has been criticized for the fact that it only takes day trips into consideration that last at least two hours. Research has shown that the average length of walking trips, which often takes place in a forest or other type of nature area, is about 1.5 hours. In 2004, the survey series Continu VrijeTijdsOnderzoek (Continuous Leisure Time Research) has started, which includes trips of at least one hour (CVTO, 2005).

Based on a longitudinal time budget survey amongst a representative sample of the Dutch population (SCP, 1998; Roes, 2001), it is shown that the share of Dutch inhabitants that visits a nature area, an urban park or forest, a recreation area and/or another green area at least once year has slightly increased in the 1980s, but has subsequently gradually decreased (see Table 4.3).

Table 4.3 Visits to nature areas, forests and other green areas from 1979 until 1999 (inhabitants older than 6 year) (Source: SCP, 1998; Roes, 2001)

	Visit participation (% at least once a year)				
	1979	1987	1991	1995	1999
Protected nature areas	35	37	40	35	35
Forest, heather, agricultural area or lakes	69	69	72	69	67
Other man-made green recreational areas	41	48	52	47	43
Urban park or forest	43	46	47	42	41

²¹ Activities that are included in the nature destinations are: touring (walking, cycling, going for a drive, ice skating on natural ice, etc.), aquatic sports (sailing, surfing, canoeing, fishing, motorboat, etc.), location activities (sunbathing, having a picnic, relaxing), and nature education activities. For more information about the Day

As these figures make clear, about one third of the Dutch population visits a protected nature area at least once a year and two thirds visits a forest, heather landscape, agricultural landscape or a lake at least once a year. Both recreational areas and urban parks and urban forests are each visited by more than 40% of Dutch inhabitants once a year. If we compare the figures of 1999 with the findings of the most recent public survey, it appears that only parks and forests in urban areas are visited somewhat less nowadays (De Bakker *et al.*, 2007)²².

4.3.3 Politics: deciding for nature

Sub-indicator 5: Importance policy theme

Inhabitants can participate in politics in a ‘passive’ way through elections for the national parliament. The analysis of voting trends in the Netherlands is relatively complicated, because there are many different political parties and none of them focuses exclusively on environmental issues. Moreover, the intensity of the ‘green colour’ of each party might vary dramatically throughout the years²³.

We have selected an indicator that gives insight in the priority people assign to a variety of policy themes of national importance. In one of the questions of the 2006 public survey, ten policy themes were listed; nature was one of them. Respondents were asked which policy themes should be an important priority of national authorities. They could pick out the four most important ones (Figure 4.7).

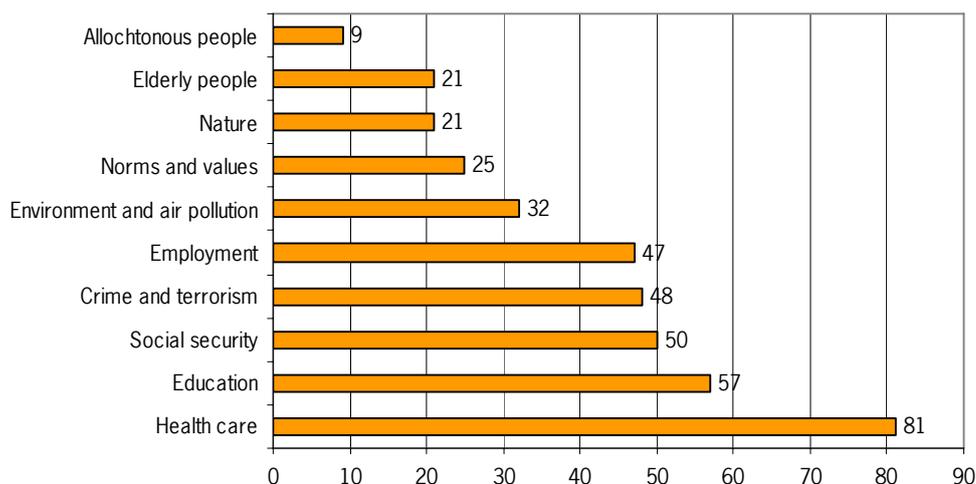


Figure 4.7 Percentages of Dutch inhabitants that rank policy themes among the 4 most important ones (Source: De Bakker *et al.*, 2007)

²² The research of De Bakker *et al.* (2007) makes a distinction between (i) urban parks, forests, public gardens, and (ii) nature areas (forests, heather, dunes, lakes, etc.). The amount of visits for the last year was operationalized into: (almost) never, a couple of times, regularly, often, very often/daily.

²³ The Stichting Natuur en Milieu (The Netherlands Society for Nature and Environment, www.natuurenmilieu.nl) has assessed the political programs of all the political parties on the benefits for nature and environment. The programs of the ChristenUnie (Christian Union), Green Left (Groen Links) and the Socialistische Partij (Socialist Party) score well. Together these parties represent 26% of the electorate (www.allesoverdeverkiezingen.nl). In 2003, 13% of the electorate voted on one of these three parties (CBS Statline). This increase appears to be favourable for nature and environment policy themes. There is great gap, however, between actual and intended voting behaviour. If people are being asked whether they would vote on a political party that prioritizes nature, 73% of the Dutch population answers affirmatively (De Bakker *et al.*, 2007).

It is clear that health care is the far most important policy theme according to Dutch citizens (Figure 4.7). Nature is not often prioritized (21%), and less than environment and air pollution (32%).

In the 2001 survey, 56% of the respondents are of the opinion that nature protection belongs to the top 4 priority policy themes; exactly the same percentage as for environmental pollution. Part of the difference between 2006 and 2001 may be due to modifications of the questionnaire: in 2001 the item was 'conserving nature', in 2006 'nature'; the other policy themes were also somewhat different, in accordance to the public and political agendas of the time (Figure 4.8). Nonetheless, the figures plausibly demonstrate that political priority for nature protection has gone down among the Dutch public.

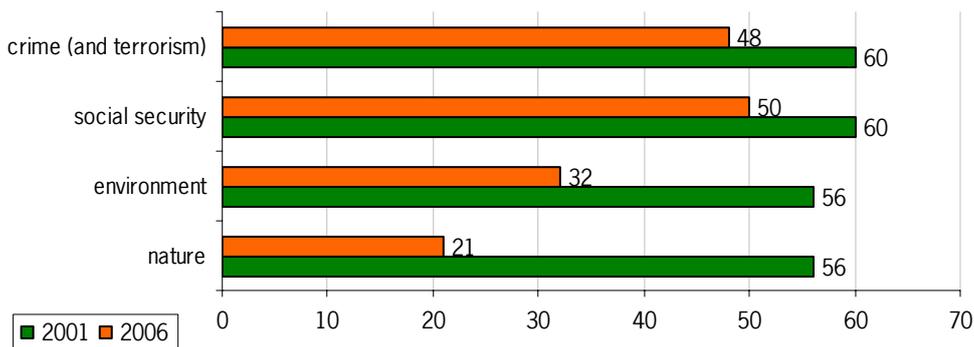


Figure 4.8 Percentages of Dutch inhabitants ranking a policy theme among the top 4, compared between 2001 and 2006, for nature, environment, and two other important policy themes (source: De Boer & Schulting, 2002; De Bakker et al., 2007)

Sub-indicator 6: Participation in decision-making processes

The final indicator we selected, representing the active mode within the domain of politics, is the level of participation in decision-making processes. Figure 4.9 shows the result of the desired level of participation of citizens in nature issues related decision-making processes.

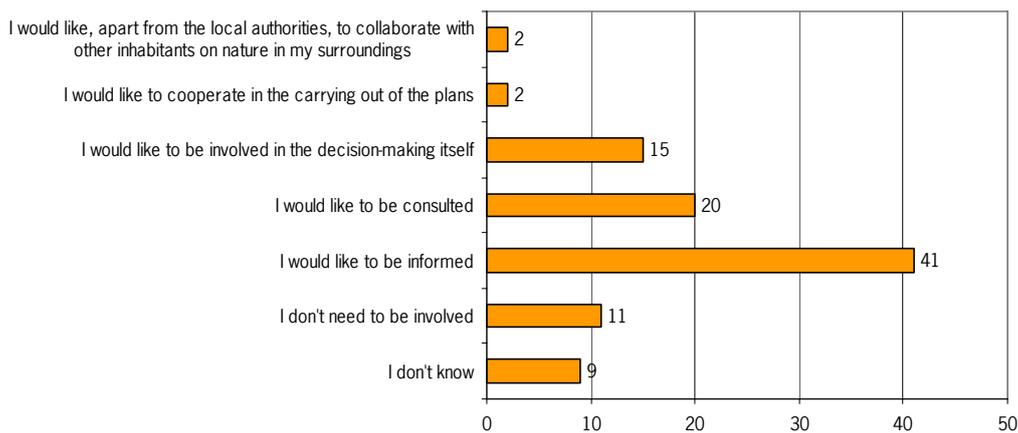


Figure 4.9. Desired level of participation in decision-making with respect to neighbourhood/local nature (N=1,485) (source: De Bakker et al., 2007).

One in five respondents deliberately refuses any involvement or does not know whether (s)he would like to participate or not. A large group (41%) prefers a passive level of receiving

information. The other 39% prefer a more active involvement, whereby half would like to be consulted (21%) and the other half (22%) would like to cooperate in different parts of the strategic and operational planning and management of 'neighbourhood nature' (green elements and areas within the own residential area).

4.4 Conclusion

Based on this chapter we can outline the present state and historical trend of the headline indicator 'public awareness and participation'. The results from our empirical findings are summarized in Table 4.4.

Table 4.4 Present state and historical trend of the headline indicator 'public awareness and participation'

PUBLIC PARTICIPATION	Domains of activities		
	<i>Conservation: protecting nature</i>	<i>Consumption: using nature</i>	<i>Politics: deciding for nature</i>
PUBLIC AWARENESS	<i>Awareness of the need for protecting nature</i>		
	Public awareness has decreased: high public awareness group has declined from 42% in 2001 to 30% in 2006 in favour of medium public awareness group which has grown from 48% in 2001 to 61% in 2006. The low public awareness group stayed the same		
Passive	<i>Membership of a nature conservation organization</i> High and increased membership: 0.4 million in 1990 2.1 million in 2000 2.2 million in 2005	<i>Interest in information about nature</i> High interest: 78% of the Dutch population uses information sources about nature (other than TV) in 2006	<i>Priority for nature in government policy</i> Less priority: 21% of Dutch inhabitants prioritizes nature as policy item in 2006, compared 56% in 2001
Active	<i>Volunteer work for nature and landscape conservation</i> Number of volunteers has increased: from 53,000 in 2001 to almost 77,000 in 2005	<i>Visits to nature and forest areas</i> Number of visits to nature areas (day trip > 2 hours) has slightly decreased: 123.8 million in 1991/1992 111.2 million in 1995/1996 110.7 million in 2001/2002	<i>Participation in nature policy decision-making</i> Desired level of participation: 61% no or passive involvement, 20% consultation, 19% co-operation

Public awareness

The awareness of the need for nature protection is considered as important by many people. There is only a limited group of people who rejects the need for nature protection (about 10%). However, the group with a high awareness of the need for nature protection has decreased from 42% in 2001 to 30% in 2006. This decrease is largely caused by a group of people who favour economic progress above nature.

Public participation

Our conclusions with regards to public participation will be explained by the three domains of activities, i.e. conservation, consumption and politics.

- *Conservation*: protecting nature. The involvement of the Dutch population in conservation activities is impressive and has increased largely over the last decades. Membership of nature conservation organizations has grown from 0.4 million members in 1990 to 2.2 million members in 2005. The strong growth, however, seems to be stabilized. Although the group of people actively involved in nature protection is only a fraction of the group of people passively involved, it has also grown in the last decades. The average age of volunteers, however, is increasing. This trend of ageing volunteers is also observed in other domains apart from nature protection. Whether it will lead to a future decline in nature protection volunteer numbers is for now difficult to say;
- *Consumption*: using nature. A large majority of the Dutch population uses information sources about nature (78% in 2006). The number of day trips to nature areas in the Netherlands of at least two hours has slightly decreased: 123.8 million in 1991/1992, 111.2 million in 1995/1996 and 110.7 million in 2001/2002. Compared to the growth of the Dutch population in this period (1991: 15.0 million inhabitants and 2001: 16.0 million inhabitants, implying 6.5 % growth), the number of visits is lagging behind;
- *Politics*: deciding for nature. Nature is not a very prominent policy theme according to Dutch citizens in 2006. One in five Dutch residents prioritizes nature as an important policy theme, which is less than the amount of people prioritizing environment and air pollution (32%). In 2001, 56% of the respondents are of the opinion that both nature protection and environmental pollution should be important policy themes. Regarding the desired level of participation in decision-making processes with respect to neighbourhood/ local nature, we can conclude that 61% wish no or passive involvement, 20% want to be consulted and 19% prefer a form of co-operation between citizens and government.

5 Further exploring the headline indicator public awareness and participation

In Chapter 4 we have presented the sub-indicator for public awareness as well as the sub-indicators for public participation. In this section we further analyse the relationships between the different sub-indicators, and between the sub-indicators and the support for specific nature related measures.

5.1 Public participation: conservation, consumption and politics

All sub-indicators for public participation show positive and significant correlations with each of the other sub-indicators. Put in words, correlation analysis shows that²⁴:

- *Conservation*: the number of memberships of nature conservation organizations is positively associated with the number of voluntary activities people participate in;
- *Consumption*: the more often people visit urban green and nature areas, the more often they show interest in a diverse number of information sources;
- *Politics*: the more actively people want to participate in decision-making processes, the more often people prioritize nature as an important policy theme;
- *Conservation with consumption*: the more frequently people are member of a nature conservation organization or are active in voluntary activities, the more they are interested in different sources of information or the more frequently they visit nature areas;
- *Conservation with politics*: the more frequently people are member of a nature conservation organization or are engaged in voluntary activities, the more active people want to participate in decision-making processes or the more often they prioritize nature as an important policy theme;
- *Consumption with politics*: the more people are interested in different sources of information or visit nature areas more frequently, the more actively people want to participate in decision-making processes or the more often they prioritize nature as an important policy theme.

5.2 The relations between public awareness and participation

There also exist positive relationships between public awareness and participation, but they are less straightforward as the correlations among participation indicators. Table 5.1 compares the scores on public participation sub-indicators for the three public awareness groups²⁵. We discuss the scores for each domain of activities.

²⁴ Correlations between the sub-indicators of public participation are depicted in Table 1 of Appendix 2 (only for the 2006 Survey).

²⁵ Correlations between the public awareness indicator and the public participation sub-indicators of the 2001 and 2006 surveys (if available) are depicted in Tables 2 and 3 of Appendix 2.

Conservation: protecting nature

Table 5.1 shows that high awareness groups are far more often member of a nature conservation organization and more frequently volunteer for nature and landscape management than the other two awareness groups. The relationship between awareness and volunteer work, however, is not unambiguous. Respondents with a low awareness of the need for nature protection, are more frequently participating in nature and landscape management than those with a medium awareness (16% against 10% in 2006 and 3% against 2% in 2001). The figures on volunteer work in this table are based on the self-reported activity in the public surveys. The differences in percentages between 2001 and 2006 do not fully correspond with the numbers reported by organizations, as used in the headline indicator (Figure 4.4.); this may be due to differences in the surveys of 2001 and 2006. Nonetheless, the observation that a relatively high level of participation in nature protection can go together with relatively low level of awareness, applies to both the 2001 and the 2006 data. A tentative explanation is that part of the volunteers has a rather pragmatic view of nature, for example because they are rural dwellers with affinity to agriculture and mixed feelings about nature protection.

Consumption: using nature

The higher the public awareness, the more people use information sources about nature. The high awareness group visits forest and nature areas regularly and the other two groups visit forest and nature areas from a couple of times a year to regularly.

Politics: deciding for nature

The higher the public awareness, the more people prioritize nature as an important policy theme. There is also a positive relationship with the preferred level of involvement in policy-making with respect to local nature: 92% of the high awareness groups wants to be involved, compared to 77% and 69% of the medium and low awareness groups. Respondents in the high awareness group would –on average– like to be involved at the level of consultation, whereas the average level of the other two groups ranges from being informed to being consulted.

Table 5.1. Participation levels within the domains of conservation, consumption and politics for the public awareness groups in 2001 and 2006

	Public awareness groups*					
	2001			2006		
	high	medium	low	high	medium	low
Conservation						
Membership	42%	33%	21%	42%	26%	22%
Volunteer	4%	2%	3%	14%	10%	16%
Consumption						
Information sources	-	-	-	83%	76%	74%
Visit nature/forests	-	-	-	regularly	couple of times/regularly	couple of times/regularly
Politics						
Nature policy priority	69%	49%	29%	32%	17%	14%
Level decision-making involvement (yes)	-	-	-	92%	77%	69%
level of involvement	-	-	-	consult	info/consult	info/consult

* All group differences are significant at $P < 0.001$, except for volunteer members in 2001 and 2006 for which $P < 0.05$.

5.3 The headline indicator and public support for nature policy measures

A potential alternative sub-indicator for public awareness and participation is public support for nature policy measures. Questions on this topic were included in the public surveys of 1996, 2001 and 2006. For reasons explained below, we decided not to incorporate these results into the headline indicator. However, they might be of interest for future indicator development. In this section we will analyse to what extent public awareness and participation with regard to nature is related to public support for nature policy measures. In the 2006 survey Dutch inhabitants have been asked to assess the importance of eight nature policy measures. Results are presented in Table 5.2 (De Bakker *et al.*, 2007). De Bakker *et al.* (ibid.) conclude that most of the Dutch people support the listed policy measures.

Table 5.2 The importance of nature policy measures (N=1,485, %) (Source: De Bakker *et al.*, 2007) *

Policy measure	% (very) important
Protection of existing nature areas	95
Nature education at schools	88
Protection of rare plants and animals and nature areas of special interest	87
Development of new nature areas	77
More nature in towns and cities	74
More nature at the countryside	60
More benches, information boards and trails for biking, hiking and horseriding	59
Connection of nature areas	56

* People that stated they don't know are excluded from the analysis

Longitudinal analysis shows that public support for nature policy with regards to the *protection of existing nature areas* and the *development of new nature areas*, two policy measures mentioned in Table 5.2, is largely stable. Figure 5.1 depicts the results for 1996, 2001 and 2006.

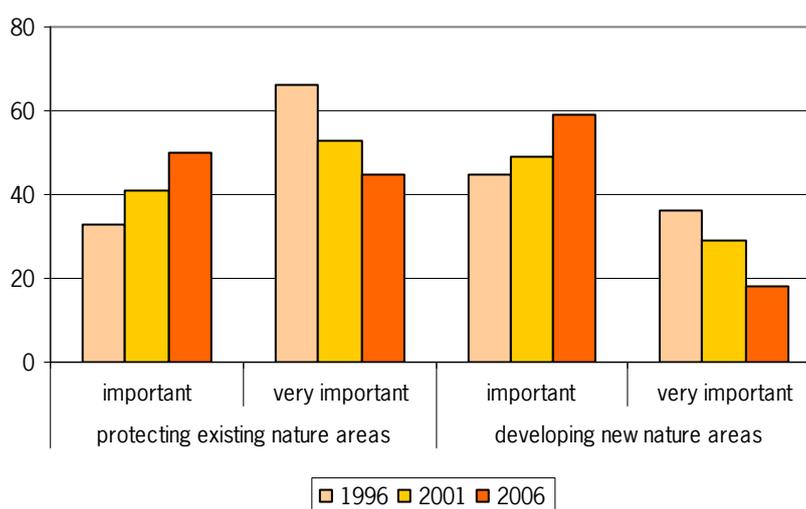


Figure 5.1. Percentage of Dutch people that is of the opinion that the protection and development of nature areas is (very) important

In 1996, 94% of the Dutch population is of the opinion that the protection of existing nature areas is (very) important, compared to 95% in 2006. As regards the development of new nature, public support is 81% in 1996 and 77% in 2006 respectively (Buijs & Volker, 1997; De Bakker *et al.*, 2007). However, if we take a closer look at Figure 5.1, we can observe that throughout the years public support for the protection of existing nature areas and the development of new nature areas decreased from very important to important.

Public support for the above mentioned policy measures is strongly correlated to public awareness, as it is measured in the headline indicator. The more people agree on the need for nature protection, the more they are of the opinion that existing nature areas need protection and new nature areas should be developed. High awareness is also positively related to support for the protection of rare plants and animals as well as nature areas of special interest. Last but not least, awareness is positively correlated with a support for more green in urban areas, for nature education at schools, and for the connection of nature areas in ecological networks. There is no relation between awareness of the need for nature protection and support for supplying more recreational facilities (benches, etc.).

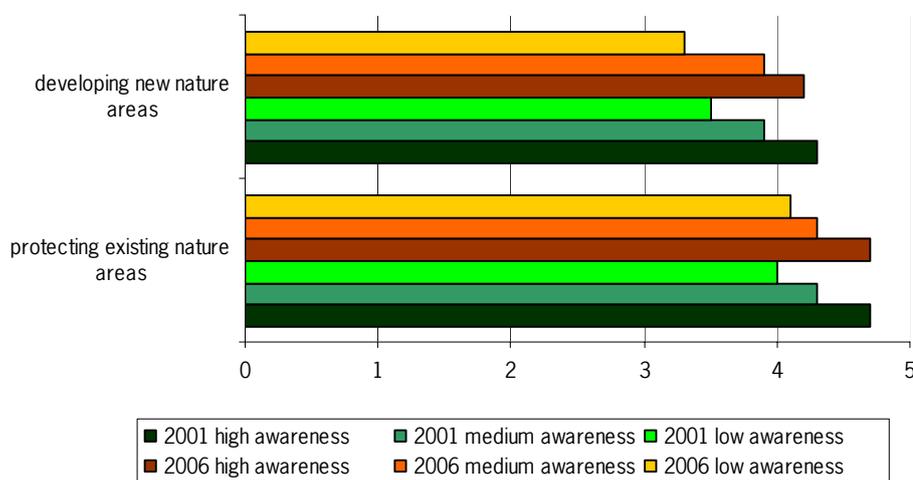


Figure 5.2. Public support for two policy measures in 2001 and 2006, compared for three public awareness groups (support is expressed in average score for importance, ranging from 1 = not important at all to 5 = very important)

Figure 5.2 compares public support for the protection of existing nature areas and the development of new nature areas for the three public awareness groups in 2001 and 2006. As the graph shows, support is rather stable in time, but among the low awareness group, it appears to shift somewhat from developing new areas to protecting existing areas.

Among the listed policy measures, those concerning protection of existing areas and development of new areas, as well as those concerning protection of rare plants and animals can be considered as important to biodiversity conservation. However, nature in the countryside can be relevant as well, for instance for agro-biodiversity. Also the connections of nature areas in ecological networks and nature in urban areas have biodiversity relevance. Support for environmental education could be seen as an indicator of public support for promoting biodiversity awareness. Moreover, within the indicator framework presented, support for policy measures could be characterized as sub-indicator for awareness, but also as sub-indicator for (passive) participation in the domain of politics. In other words, how public support for these different measures should be interpreted in the perspective of the headline

indicator framework is not fully clear yet and should be further explored. Therefore, we leave the question whether public support for specific policy measures could be a useful sub-indicator open to further debate.

Conclusions

In this chapter, we have presented some further analyses of the headline indicator. These analyses show that:

- There is, in general, a fairly strong coherence between all sub-indicators for awareness and participation;
- An exception to this is found in the relationship between awareness and volunteer work for nature; here both the high and the low awareness groups show more volunteer activity than the medium awareness group;
- The analyses corroborate the trend observed in the previous chapter, that there is a large public support for nature protection, but the percentage of citizens that give nature a very high priority is lower than in the past;
- Public support for specific nature protection measures may be used in the future as sub-indicator, but further discussion is needed about the relevance of different measures for the headline framework.

6 Conclusion, discussion and future challenges

6.1 Conclusion

The conclusions of the report are presented according to the aims formulated in the first chapter.

Insight into the 'public awareness and participation' policy of the CBD and EU

On the global and the European level of biodiversity policy, the importance of public awareness and participation is underlined by analysts and policy makers. At the global level the most important process for indicator development is the elaboration of the biodiversity indicator set by the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA). In this elaboration process, however, the development of indicators for public awareness and participation is seriously lagging behind indicator development in most other focal areas.

The SEBI2010 project has included in its set of headline indicators a focal area of public opinion, with indicators for public awareness and participation. However, also at the European level clear guidelines for indicators are still lacking. This implies that developing indicators for public awareness and participation, at this moment, has to be a bottom-up process in which current experiences in different European countries may lead to a more general approach to awareness and participation indicators can emerge.

Development of the indicator 'public awareness and participation'

In this report, public awareness is in principle defined as *awareness of the importance of, and the measures required for biodiversity conservation*. In view of the general level of public understanding of biodiversity, however, this concept is made operational as *awareness of the need for nature protection*. We conceptualize public participation as *'nature related activities of people within the domains of conservation, consumption, and politics'*. In each of these domains, a more active (a) and a more passive (p) sub-indicator is selected:

- Nature conservation: protecting nature
 - Membership of a nature protection organization (p)
 - Volunteer work for nature and landscape conservation (a)
- Nature consumption: using nature
 - Interest in information about nature (p)
 - Visits to nature and forest areas (a)
- Nature politics: deciding for nature
 - Priority for nature in government policy (p)
 - Participation in nature policy decision-making (a).

It is assumed that public awareness and public participation, thus conceptualized, are closely related to each other and together constitute an adequate headline indicator for people's effective concern for biodiversity.

Assess the current state and the trend in the Netherlands

In sum, the present headline indicator demonstrates that public awareness of the need for nature protection is high and public support and public participation remains fairly strong.

Tendencies in awareness and participation are still difficult to predict, but appear to be negative rather than positive. Public awareness of the need for nature protection has decreased since 2001. Participation within the domain of conservation is large and has increased significantly since 1990. Participation within the domain of consumption is large, but the number of visits to nature and forest areas decreased since 1992. Participation within the domain of politics is uncertain as the priority for nature in government policy has also decreased since 2001.

A significant, positive, and fairly strong correlation is found among all sub-indicators, with the exception of volunteer work. A relatively high level of volunteer work is found in both low awareness and high awareness groups.

Consistency of the indicator development and analysis with the CBD process and the European biodiversity policy

The proposed headline indicator does a good job in mapping awareness and participation with regard to nature conservation. Compared to the aims and policies set out in the CBD process, however, several aspects are still missing:

- The present headline indicator is not specific to biodiversity. Given the present state of general biodiversity awareness, it may not be useful to include questions on biodiversity per se in public surveys. In line with the CBD process, however, awareness of biodiversity, of its meaning for human well-being, and of the measures needed for its conservation needs to be further promoted. More specific indicators would be useful for monitoring progress towards this goal;
- In using nature as a proxy for biodiversity, some particular aspects of biodiversity are neglected. This is, among others, the case for agro-biodiversity. From the viewpoint of CBD and EU biodiversity policy, it would be interesting to include indicators for public awareness and participation with regard to agro-biodiversity. It is not clear, however, how such an indicator can be made operational;
- In line with the CBD process, it would be useful to develop not only indicators for public awareness and participation, but also for government's and society's capacity of communicating, educating, and facilitating participation. Such indicators would be particularly relevant to stimulate and monitor activities by government and civil society for promoting biodiversity awareness and participation.

6.2 Discussion

6.2.1 Comparison of the Dutch situation with other countries

Our comparison deals with the situation in England and Belgium only, as it proved difficult to find comparable results from other countries. The comparison is based on DEFRA (2003) for England and Dumortier *et al* (2005) for Belgium.

Public awareness

Whereas Belgium has not developed this indicator, biodiversity researchers in England have developed a set of questions to measure public awareness (DEFRA, 2003) Firstly, they measured the amount of people who are aware of the phrase 'biodiversity'. Next, they asked people's concern for the loss of wildlife in the UK. Finally, they assessed public support for payments to farmers to protect wildlife. Of these three indicators, concern for the loss of wildlife comes most closely to the concept of awareness used in our report. In England,

concern for loss of wildlife has increased from 38% in 1986 to 50% in 2001. The DEFRA report does not provide more recent data.

Public participation

At the level of sub-indicators for participation, we can observe that both the English and the Belgian report have chosen indicators within the domains of:

- *Consumption*: frequency of visits to nature reserves and woodlands (England) and forests and nature reserves (Belgium);
- *Protection*: volunteer time spent in conservation activity, membership of biodiversity organizations (England), and membership of non-governmental organizations for nature conservation (Belgium).

No indicators with explicit reference to participation in the domain of politics have been developed according to these reports, although support for payments could be regarded as an indicator for passive policy support in England.

Consumption

On basis of the aforementioned reports, we can observe that in England the amount of day trips to woodlands has increased from 273 million in 1994 to 321 million in 1998. However, the number of people making these visits has remained fairly stable (from 37% in 1994 to 39% in 1998). The number of visits to National Nature Reserves increased from 8 million in 1997-1998, to 13 million in 2000-2001, but dropped to 9 million in 2001-2002 (probably due to Foot and Mouth Disease). They conclude that visitor numbers fluctuate throughout the years and that –most likely– they seem to stabilize after an increase in the 1980s and 1990s.

In Belgium, they do not present actual visitor numbers, but the percentage of people reporting visits to forests or nature reserves. A main conclusion is that public interest is decreasing slightly, particularly for the number of people visiting forests once or several times a month.

Protection

Membership numbers in Belgium reach over 54,000 members, which is 0.9% of the population. This is rather low compared to the Dutch situation. In England, the number of people volunteering for the Wildlife Trusts and Marine Conservation Society has increased steadily from about 22,000 in 2000 to 25,000 in 2002 (DEFRA, 2003).

From this comparison, it appears that general trends in Belgium and England are quite similar to those in the Netherlands. For a more reliable and detailed comparison however, more recent and better harmonized data would be needed.

6.2.2 Assessment of 'public awareness and participation' indicator

Criteria for the review of each headline indicator which are developed by the Coordination Team of the SEBI2010 project (Figure 1.2 in Chapter 1). Below the headline indicator developed in this report is assessed according to these criteria.

1. *Policy relevant and meaningful*. On base of the analysis of global, European, and national biodiversity policy processes, the headline indicator developed appears to be relevant and meaningful. However, as no specific targets are defined for public awareness and participation yet, indicators cannot be used for determining distance to targets. Neither can the present headline indicator illuminate which options for action are most appropriate; for this purpose indicators of communicating and educating capacities of government and civil society would be useful, but they are not developed yet.

2. *Biodiversity relevant.* The headline indicator is relevant to biodiversity as far as nature can be used as a proxy for biodiversity. For most aspects of biodiversity, this is acceptable, given the present situation of public awareness. However, some aspects of biodiversity, such as agro-biodiversity, are not well represented.
3. *Scientifically sound and methodologically well founded.* The report makes considerable effort to underpin the indicators, as well as to identify lacks in scientific foundation. Of the sub-indicators applied, particularly use of nature information, priority for nature in policy, and participation in decision making would benefit from further underpinning and standardization.
4. *Progress towards target.* As long as no clear targets are set, we can only provisionally respond to this criterion. On base of the assessment in this report, it is plausible that at this moment there is no progress, but rather a fairly stable situation, which in some aspects – e.g. giving high priority to biodiversity conservation - may even show a slightly negative trend.
5. *Broad acceptance and understandability.* The composition of the headline indicator was guided by criteria of policy relevance, comparability, and practical feasibility. We believe that these criteria have also contributed to their acceptability and understanding.
6. *Affordable monitoring, available and routinely collected data.* All data are from existing data sources.
7. *Affordable modelling.* Modelling is as yet not relevant to this headline indicator. Further research would be of interest, but caution is warranted against ill-founded application of causal models in social processes.
8. *Spatial and temporal coverage of data.* The sub-indicators are nationally based and deliberately chosen to enable comparison in time with previous surveys of public support for nature, and to facilitate comparison with other countries. However, further standardization en international exchange is needed to improve comparability in time and space.
9. *National scale and representativeness of data.* The headline indicator is of national scale and based on representative data.
10. *Sensitive.* The indicators that constitute the headline indicator are sensitive to changes in time, as is demonstrated by the assessments.
11. *Representative.* To provide a full and representative picture of the Driving Force-Pressure-State-Impact-Response (DPSIR) chain, a headline indicator for awareness and participation is indispensable. Awareness and participation are crucial factors in improving the response to biodiversity degradation and tackling its drivers. To better fulfil its key role in the DPSIR chain, the headline indicator would need further development, for instance towards including capacity indicators.
12. *Small number.* In view of the number of indicators in other focal areas, and the vital place of awareness and participation in biodiversity conservation policy, one headline indicator with seven sub-indicators appears to be a modest and justified addition to the full indicator set.
13. *Aggregation and flexibility.* Aggregation and flexibility, as far as this headline indicator is concerned, are contingent on further research and cross-national harmonization.

6.3 Future challenges

As has been argued in this report, the development of indicators for public awareness and participation is lagging behind in the process of establishing and streamlining a biodiversity indicator framework. Given the widely acknowledged importance of public awareness and participation for biodiversity conservation, it is a major challenge to improve of this situation.

Two key areas for further improvement can be identified on the basis of this report:

1. Elaborating and harmonizing existing European indicators for public awareness and participation with regard to biodiversity. Potential improvements include:
 - Further specification and cross-national harmonization of sub-indicators of public awareness and participation with regard to nature and biodiversity;
 - Further development of indicators for awareness and participation that are specific to biodiversity as a concept and to aspects of biodiversity conservation not included in existing surveys of public support for nature;
 - Further enhancement of scientific insight in the relationships between awareness and participation and in the optimal structure of the headline indicator, through cross-national debate and research.
2. Developing additional indicators for the capacities and actual measures of government and civil society for promoting public awareness and participation with concern to biodiversity. As the indicator trends show, the current trends of awareness and participation are stable, at best. To increase awareness and participation, additional efforts of governmental and non-governmental actors are necessary. Monitoring capacities and measures - next to monitoring awareness and participation - can contribute to producing and improving these efforts.

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Appendix 1 Technical background

The technical background of the following information sources will be explained:

- Public support research 1996;
- Public support research 2001;
- Public support research 2006;
- CBS Day Trip Survey;
- Environmental Data Compendium.

Information source	Public support research 1997 (Buijs & Volker, 1997)
Data	
Data source	Survey
Used variables	Public awareness: 2 statements
Sampling method	Representative sample Dutch population (N = 1,999) Onetime sampling in august/September 1996 First phase: Computer Assisted Telephone Interviewing (N=3,002). Second phase: written questionnaire (N=1,999). Sample: 18 years and older Response: 67%
Geographical coverage	Nation wide
Temporal coverage	1996
Data collector	Intomart
Bias and gaps in the sampling	Population nature lovers might be overrepresented in the sample
Data quality: indicate precision and uncertainties	Risk of social desirable answers
Potential for updating: ongoing monitoring/ad hoc surveys	Survey to be carried out every 5 years
Responsible organization for data collection	Alterra
Owner of data	Alterra & WOT Natuur & Milieu
Involved researchers	Arjen Buijs & Kees Volker
Custodian of data	WOT Natuur & Milieu
Methods	
Procedure of data processing	Statistical analysis by means of SPSS
Person responsible for calculations	Birgit Elands

Information source	Public support research 2001 (De Boer & Schulting, 2002)
Data	
Data source	Survey
Used variables	Public awareness: 3 statements Public participation: 1) priority for nature in government policy
Sampling method	Representative sample Dutch population (N = 1,551) Onetime sampling in 2001 Sample: 18 years and older Response: 74%
Geographical coverage	Nation wide
Temporal coverage	2001
Data collector	NIPO
Bias and gaps in the sampling	Sample is taken out of a panel, which regularly takes part in surveys. Population nature lovers might be overrepresented in the sample
Data quality: indicate precision and uncertainties	Risk of social desirable answers
Potential for updating: ongoing monitoring/ad hoc surveys	Survey to be carried out every 5 years
Responsible organization for data collection	Alterra
Owner of data	Alterra & WOT Natuur & Milieu
Involved researchers	Tineke de Boer & Renske Schulting
Custodian of data	WOT Natuur & Milieu
Methods	
Procedure of data processing	Statistical analysis by means of SPSS
Person responsible for calculations	Birgit Elands

Information source	Public support research 2006 (De Bakker et al., 2007)
Data	
Data source	Survey
Used variables	Public awareness: 3 statements Public participation: <ol style="list-style-type: none"> 1) use information about nature 2) priority for nature in government policy 3) participation in nature policy decision-making
Sampling method	Representative sample Dutch population (N = 1,485) Onetime sampling in august/September 2006 Sample: 16 years and older Response: 87%
Geographical coverage	Nation wide
Temporal coverage	2006
Data collector	TNS-NIPO
Bias and gaps in the sampling	Sample is taken out of a panel, which regularly takes part in surveys. Population nature lovers might be overrepresented in the sample
Data quality: indicate precision and uncertainties	Risk of social desirable answers
Potential for updating: ongoing monitoring/ad hoc surveys	Survey to be carried out every 5 years
Responsible organization for data collection	LEI
Owner of data	LEI & WOT Natuur & Milieu
Involved researchers	Erik de Bakker, Kris van Koppen & Janneke Vader
Custodian of data	WOT Natuur & Milieu
Methods	
Procedure of data processing	Statistical analysis by means of SPSS
Person responsible for calculations	Birgit Elands

Information source	CBS Day Trip Survey 2001-2002
Data	
Data source	Survey
Used variable	Visits to forest and nature areas
Sampling method	Representative sample Dutch population (N who has noted day trips is almost 12,000) All year sampling from December 2001 until November 2002 Every two weeks a new group of respondents has been approached Response regarding Day Trip Survey: about 45%
Geographical coverage	Nation wide
Temporal coverage	December 2001-November 2002
Data collector	CBS Statistics Netherlands
Bias and gaps in the sampling	Unknown
Data quality: indicate precision and uncertainties	Only day trips that take at least 2 hours are measured. Day Trips during holidays (either in the Netherlands or abroad) are not integrated
Potential for updating: ongoing monitoring/ad hoc surveys	Survey to be carried out every 5 years
Responsible organization for data collection	CBS Statistics Netherlands
Owner of data	CBS Statistics Netherlands
Involved researchers	
Custodian of data	CBS Statistics Netherlands
Methods	
Procedure of data processing	Statistical analysis by means of SPSS
Person responsible for calculations	Henk Swinkels (CBS) and Birgit Elands (WOT Natuur & Milieu)
CBS Day Trip Survey 1991-1992 and 1995/1996	Similar research design
More information	http://www.cbs.nl/nl-NL/menu/methoden/dataverzameling/dagrecreatie.htm

Information source	Environmental Data Compendium
Data	
Data source	Membership administration of the main Dutch nature conservation organizations and 'Vroege Vogels Parade' (http://vroegevogels.vara.nl/portal?scr=news_newsitem1&id=236406). For more detailed information: http://www.mnp.nl/mnc/i-nl-1281.html
Used variable	Membership of nature conservation organizations
Geographical coverage	Nation wide
Temporal coverage	Whole year
Potential for updating: ongoing monitoring/ad hoc surveys	Ongoing monitoring
Responsible organization for data collection	Netherlands Environmental Assessment Agency, Statistics Netherlands & Wageningen University and Research Centre
Owner of data	Netherlands Environmental Assessment Agency, Statistics Netherlands & Wageningen University and Research Centre
Custodian of data	Environmental Data Compendium (http://www.mnp.nl/mnc/index-en.html)
Methods	
Procedure of data processing	Excel
Person responsible for calculations	Birgit Elands (WOT Natuur & Milieu)

Information source	Environmental Data Compendium
Data	
Data source	Administration Landschapsbeheer Nederland, IVN Nederland & VOFF. For more detailed information: http://www.mnp.nl/mnc/i-nl-1276.html , http://www.mnp.nl/mnc/i-nl-1277.html , http://www.mnp.nl/mnc/i-nl-1274.html and http://www.mnp.nl/mnc/i-nl-1278.html
Used variable	Volunteer work for nature and landscape conservation
Geographical coverage	Nation wide
Temporal coverage	Whole year
Potential for updating: ongoing monitoring/ad hoc surveys	Ongoing monitoring
Responsible organization for data collection	Netherlands Environmental Assessment Agency, Statistics Netherlands & Wageningen University and Research Centre
Owner of data	Netherlands Environmental Assessment Agency, Statistics Netherlands & Wageningen University and Research Centre
Custodian of data	Environmental Data Compendium (http://www.mnp.nl/mnc/index-en.html)
Methods	
Procedure of data processing	Excel
Person responsible for calculations	Birgit Elands (WOT Natuur & Milieu)

Appendix 2 Correlation analysis public awareness and participation sub-indicators

Correlation analysis of the different public participation sub-indicators (2006 survey; N=1485; each cell contains the Pearson correlation and significance (2-tailed))

		CONSERVATION		CONSUMPTION			POLITICS	
		Membership numbers	Number of voluntary activities	Number of information sources	Frequency visits city green	Frequency visits nature areas	Priority nature as policy theme	Level of participation decision-making processes
C O N S E R V A T I O N	Membership numbers	1						
	Number of voluntary activities	.147 .000	1					
C O N S U M P T I O N	Number of information sources	.233 .000	.180 .000	1				
	Frequency visits city green	.089 .001	.138 .000	.262 .000	1			
	Frequency visits nature areas	.158 .000	.155 .000	.320 .000	.276 .000	1		
P O L I T I C S	Priority nature as policy theme	.129 .000	.070 .007	.160 .000	.132 .000	.134 .000	1	
	Level of participation decision-making processes	.099 .000	.126 .000	.220 .000	.152 .000	.177 .000	.092 .000	1

Correlation analysis of public awareness sub-indicator with the public participation sub-indicators (2006 Survey)

	Pearson Correlation	Sig. (2-tailed)
Public awareness with:		
Membership numbers	-.204	0.000
Number of voluntary activities	-.003	0.903
Number of information sources	-.168	0.000
Frequency visits city green	-.123	0.000
Frequency visits nature areas	-.163	0.000
Priority nature as policy theme	-.184	0.000
Level of participation decision-making processes	-.189	0.000

Correlation analysis of public awareness sub-indicator with the public participation sub-indicators (2001 Survey)

	Pearson Correlation	Sig. (2-tailed)
Public awareness with:		
Membership (yes/no)	-.159	0.000
Number of voluntary activities	-.063	0.013
Number of information sources	not available	-
Frequency visits city green	not available	-
Frequency visits nature areas	not available	-
Priority nature as policy theme	-.295	0.000
Level of participation decision-making processes	not available	-

Indicators for the Convention on Biodiversity 2010

In de reeks 'Indicators for the Convention on Biodiversity 2010' zijn de volgende documenten verschenen (*In the series 'Indicators for the Convention on Biodiversity 2010' the following documents have been published*):

2007

- 53.1** *Reijnen, M.J.S.M.* National Capital Index version 2.0
- 53.3** *Windig, J.J., M.G.P. van Veller & S.J. Hiemstra.* Biodiversiteit Nederlandse landbouwhuisdieren en gewassen
- 53.4** *Melman, Th.C.P. & J.P.M. Willemen.* Coverage protected areas.
- 53.6** *Weijden, W.J. van der, R. Leewis & P. Bol.* Indicatoren voor het invasieproces van exotische organismen in Nederland
- 53.7a** *Nijhof, B.S.J., C.C. Vos & A.J. van Strien.* Influence of climate change on biodiversity.
- 53.7b** *Moraal, L.G.* Effecten van klimaatverandering op insectenplagen bij bomen.
- 53.8** *Fey-Hofstede, F.E. & H.W.G. Meesters.* Exploration of the usefulness of the Marine Trophic Index (MTI) as an indicator for sustainability of marine fisheries in the Dutch part of the North Sea.
- 53.9** *Reijnen, M.J.S.M.* Connectivity/fragmentation of ecosystems: spatial conditions for sustainable biodiversity
- 53.11** *Gaaff, A. & R.W. Verburg.* Government expenditure on land acquisition and nature development for the National Ecological Network (EHS) and expenditure for international biodiversity projects
- 53.12** *Elands, B.H.M. & C.S.A. van Koppen.* Public awareness and participation

Wot-onderzoek

Verschenen documenten in de reeks Werkdocumenten van de Wettelijke Onderzoekstaken Natuur & Milieu

Werkdocumenten zijn verkrijgbaar bij het secretariaat van Unit Wettelijke Onderzoekstaken Natuur & Milieu, te Wageningen. T 0317 – 47 78 44; F 0317 – 41 90 00; E info.wnm@wur.nl
De werkdocumenten zijn ook te downloaden via de Wot-website www.wotnatuurenmilieu.wur.nl

2005

- 1 *Eimers, J.W.* (Samenstelling). Projectverslagen 2004.
- 2 *Hinssen, P.J.W.* Strategisch Plan van de Unit Wettelijke Onderzoekstaken Natuur & Milieu, 2005 – 2009.
- 3 *Sollart, K.M.* Recreatie: Kennis en datavoorziening voor MNP-producten. Discussienotitie.
- 4 *Jansen, M.J.W.* ASSA: Algorithms for Stochastic Sensitivity Analysis. Manual for version 1.0.
- 5 *Goossen, C.M. & S. de Vries.* Beschrijving recreatie-indicatoren voor de Monitoring en Evaluatie Agenda Vitaal Platteland (ME AVP)
- 6 *Mol-Dijkstra, J.P.* Ontwikkeling en beheer van SMART2-SUMO. Ontwikkelings- en beheersplan en versiebeheerprotocol.
- 7 *Oenema, O.* How to manage changes in rural areas in desired directions?
- 8 *Dijkstra, H.* Monitoring en Evaluatie Agenda Vitaal Platteland; inventarisatie aanbod monitoringssystemen.
- 9 *Ottens, H.F.L. & H.J.A.M. Staats.* BelevingsGIS (versie2). Auditverslag.
- 10 *Straalen, F.M. van.* Lijnvormige beplanting Groene Woud. Een studie naar het verdwijnen van lanen en perceelsrandbegroeiing in de Meierij.
- 11 *Programma Commissie Natuur.* Onderbouwend Onderzoek voor de Natuurplanbureau-functie van het MNP; Thema's en onderzoeksvragen 2006.
- 12 *Velthof, G.L. (samenstelling).* Commissie van Deskundigen Meststoffenwet. Taken en werkwijze.
- 13 *Sanders, M.E. & G.W. Lammers.* Lokaliseren kansen en knelpunten van de Ecologische Hoofdstructuur – met informatie van de terreinbeheerders.
- 14 *Verdonschot, P.F.M., C.H.M. Evers, R.C. Nijboer & K. Dideren.* Graadmeters aquatische natuur. Fase 1: Vergelijking van de graadmeter Natuurwaarde met de Natuurdoeltypen en KRW-maatlatten
- 15 *Hinssen, P.J.W.* Wettelijke Onderzoekstaken Natuur & Milieu. Werkplan 2006
- 16 *Melman, Th.C.P., R.G. Groeneveld, R.A.M. Schrijver & H.P.J. Huiskes* Ontwikkeling economisch-ecologisch optimaliseringsmodel natuurbeheer in combinatie met agrarische bedrijfsvoering. Studie in het licht van LNV-beleidsombuiging "van verwerving naar beheer"
- 17 *Vreke, J., R.I. van Dam & F.J.P. van den Bosch.* De plaats van natuur in beleidsprocessen. Casus: Besluitvormingsproces POL-aanvulling Bedrijventerrein Zuid-Limburg
- 18 *Gerritsen, A.L., J. Kruit & W. Kuindersma.* Ontwikkelen met kwaliteit. Een verkenning van evaluatiecriteria
- 19 *Bont, C.J.A. de, M. Boekhoff, W.A. Rienks, A. Smit & A.E.G. Tonnejck.* Impact van verschillende wereldbeelden op de landbouw in Nederland. Achtergronddocument bij 'Verkenning Duurzame Landbouw'
- 20 *Niet verschenen*

2006

- 21 *Rienks, W.A., I. Terluin & P.H. Vereijken.* Towards sustainable agriculture and rural areas in Europe. An assessment of four EU regions
- 22 *Knegt, B. de, H.W.B. Bredenoord, J. Wiertz & M.E. Sanders.* Monitoringsgegevens voor het natuurbeheer anno 2005. Ecologische effectiviteit regelingen natuurbeheer: Achtergrondrapport 1
- 23 *Jaarrapportage 2005.* WOT-04-001 – Monitor- en Evaluatiesysteem Agenda Vitaal Platteland
- 24 *Jaarrapportage 2005.* WOT-04-002 – Onderbouwend Onderzoek Natuurplanbureau-functie
- 25 *Jaarrapportage 2005.* WOT-04-385 - Milieuplanbureau-functie
- 26 *Jaarrapportage 2005.* WOT-04-394 – Natuurplanbureau-functie
- 27 *Jaarrapportage 2005.* WOT-04 - Kennisbasis
- 28 *Verboom, J., R. Pouwels, J. Wiertz & M. Vonk.* Strategisch Plan LARCH. Van strategische visie naar plan van aanpak
- 29 *Velthof, G.L. en J.J.M. van Grinsven (eds.)* Inzet van modellen voor evaluatie van de meststoffenwet. Advies van de CDM-werkgroep Harmonisatie modellen
- 30 *Hinssen, M.A.G., R. van Oostenbrugge & K.M. Sollart.* Draaiboek Natuurbalans. Herzien versie
- 31 *Swaay, C.A.M. van, V. Mensing & M.F. Wallis de Vries.* Hotspots dagvlinder biodiversiteit
- 32 *Goossen, C.M. & F. Langers.* Recreatie en groen in en om de stad. Achtergronddocument bij Natuurbalans 2006
- 33 *Turnhout, Chr. Van, W.-B. Loos, R.P.B. Foppen & M.J.S.M. Reijnen.* Hotspots van biodiversiteit in Nederland op basis van broedvogelgegevens
- 34 *Dideren, K en P.F.M. Verdonschot.* Graadmeter Natuurwaarde aquatisch. Typen, indicatoren en monitoring van regionale wateren
- 35 *Wameling, G.W.W., G.J. Reinds, J.P. Mol-Dijkstra, J. Kros, H.J. Wieggers.* Verbeteringen voor de Natuurplanner
- 36 *Groeneveld, R.A. & R.A.M. Schrijver.* FIONA 1.0; Technical description
- 37 *Luesink, H.H., M.J.C. de Bode, P.W.G. Groot Koerkamp, H. Klinker, H.A.C. Verkerk & O.Oenema.* Protocol voor monitoring landelijke mestmarkt onder een stelsel van gebruiksnormen
- 38 *Bakker-Verdurmen, M.R.L., J.W. Eimers, M.A.G. Hinssen-Haanen, T.J. van der Zwaag-van Hoorn.* Handboek secretariaat WOT Natuur & Milieu
- 39 *Pleijte, M. & M.A.H.J. van Bavel.* Europees en gebiedsgericht beleid: natuur tussen hamer en aambeeld? Een verkennend onderzoek naar de relatie tussen Europees en gebiedsgericht beleid

- 40 *Kramer, H., G.W. Hazeu & J. Clement.* Basiskaart Natuur 2004; vervaardiging van een landsdekkend basisbestand terrestrische natuur in Nederland
- 41 *Koomen, A.J.M., W. Nieuwenhuizen, J. Roos-Klein Lankhorst, D.J. Brus & P.F.G. Vereijken.* Monitoring landschap; gebruik van steekproeven en landsdekkende bestanden
- 42 *Selnes, T.A., M.A.H.J. van Bavel & T. van Rheenen.* Governance of biodiversity
- 43 *Vries, S. de. (2007)* Veranderende landschappen en hun beleving
- 44 *Broekmeijer, M.E.A. & F.H. Kistenkas.* Bouwen en natuur: Europese natuurwaarden op het ruimtelijk ordeningsspoor. Achtergronddocument bij Natuurbalans 2006
- 45 *Sollart, K.M. & F.J.P. van den Bosch.* De provincies aan het werk; Praktijkervaringen van provincies met natuur- en landschapsbeleid in de periode 1990-2005. Achtergronddocument bij Natuurbalans 2006
- 46 *Sollart, K.M. & R. de Niet met bijdragen van M.M.M. Overbeek.* Natuur en mens. Achtergronddocument bij de Natuurbalans 2006
- 2007**
- 47 *Ten Berge, H.F.M., A.M. van Dam, B.H. Janssen & G.L. Velthof.* Mestbeleid en bodemvruchtbaarheid in de Duin- en Bollenstreek; Advies van de CDM-werkgroep Mestbeleid en Bodemvruchtbaarheid in de Duin- en Bollenstreek
- 48 *Kruit, J. & I.E. Salverda.* Spiegeltje, spiegeltje aan de muur, valt er iets te leren van een andere plannings-cultuur?
- 49 *Rijk, P.J., E.J. Bos & E.S. van Leeuwen.* Nieuwe activiteiten in het landelijk gebied. Een verkennende studie naar natuur en landschap als vestigingsfactor
- 50 *Ligthart, S.S.H.* Natuurbeleid met kwaliteit. Het Milieu- en Natuurplanbureau en natuurbeleidsevaluatie in de periode 1998-2006
- 51 *Kennismarkt 22 maart 2007; van onderbouwend onderzoek Wageningen UR naar producten MNP in 27 posters*
- 52 *Kuindersma, W., R.I. van Dam & J. Vreke.* Sturen op niveau. Perversies tussen nationaal natuurbeleid en besluitvorming op gebiedsniveau.
- 53.1 *Reijnen, M.J.S.M.* Indicators for the 'Convention on Biodiversity 2010'. National Capital Index version 2.0
- 53.3 *Windig, J.J., M.G.P. van Veller & S.J. Hiemstra.* Indicatoren voor 'Convention on Biodiversity 2010'. Biodiversiteit Nederlandse landbouwhuisdieren en gewassen
- 53.4 *Melman, Th.C.P. & J.P.M. Willemen.* Indicators for the 'Convention on Biodiversity 2010'. Coverage protected areas.
- 53.6 *Weijden, W.J. van der, R. Leewis & P. Bol.* Indicatoren voor 'Convention on Biodiversity 2010'. Indicatoren voor het invasieproces van exotische organismen in Nederland
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