

Towards Effective Monitoring Environment, Nature and Water

Main Report

Steering Committee for Environment, Nature and Water Monitoring

Association of the Dutch Provinces (IPO)

Dutch LNV Ministry

Dutch V&W Ministry

Dutch VROM Ministry

Netherlands Environmental Assessment Agency (MNP)

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Brief summary

The Steering Committee for Environment-Nature-Water Monitoring commissioned a review into monitoring and reporting obligations and efforts relative to the environment, nature and water in the Netherlands in terms of international, European, national and interprovincial regulation. This review considered to what degree monitoring is carried out excessively or insufficiently relative to the relevant legislation. In conclusion, it considered the actions required to arrive at a more efficient and effective method of data collection.

For the first time, this review gives a rough idea of the amount of monitoring and reporting obligations. Many suggestions and recommendations have been made for improvement of the quality and efficiency of the monitoring, and these will require further elaboration in the near future. The Steering Committee for Environment-Nature-Water Monitoring is to organise this sequel.

The conclusion is that the greater part of monitoring activities for the environment and water attract European or international obligations. In comparison, nature attracts many more nationally administered monitoring activities. (European) legislation often leaves room for individual interpretation. In many cases, monitoring is carried out in greater detail than is required by European or international directives. However, the high quality of information is in some cases undermined by inadequate quality safeguards and as a result of a lack of harmonisation of data from different monitoring programmes, which prevents the mutual comparison of data. In various cases, there are other users of the information than just the client. It is both possible and worthwhile to make data better accessible so that greater use is made of available information. In a few cases, monitoring activities are not mutually coordinated despite covering the same subjects. Only a limited number of reporting obligations have been duplicated. Most reporting obligations are borne by National Government, which then largely outsources monitoring activities to knowledge institutes and local authorities. These local authorities outsource to a far lesser degree.

The general picture is that monitoring for the environment and water is carried out reasonably efficiently, but that it could definitely be done better. For water, monitoring preparations carried out in accordance with the Water Framework Directive offer the possibility of greater optimisation and coordination of monitoring activities. With regard to nature, there exists strong demand for better coordination between the various groups requesting monitoring information (harmonisation definitions) and the monitoring programmes in progress (coordination of supply and demand). The newly established Nature Data Authority can play an important role in this.

Recommendations are made for strengthening the cooperation between authorities in order to improve content-related coordination between the different monitoring programmes and to safeguard monitoring and reporting quality. This concerns both cooperation between and within various administrative bodies (at state and provincial level), and a demand for greater control (which means less freedom) in order to improve monitoring efficiency. The steering committee in which the state, decentralised authorities and the assessment agency are represented, plays an important role in this and also maintains a grip on all monitoring and reporting obligations.

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1. Introduction

“Efficient implementation of European obligations in the field of monitoring and reporting is desperately needed”, was the conclusion of a symposium entitled *EU Directives: data collection and processing*, which was organised by the VROM Ministry, IPO and RIVM in 2003. Although Dutch environmental legislation is increasingly based on European legislation, an unambiguous and complete picture of the associated reporting and monitoring obligations is still lacking. It further emerged that it is unknown both whether the available information is used in a meaningful way, and whether the reporting and monitoring efforts could be organised in a more efficient and effective manner.

The project “Towards (Cost) Effective Monitoring (KEFM)” was initiated to answer these questions. This project has been carried out in the framework of the collaboration between the Ministry of VROM, IPO and the RIVM, later expanded to include the Ministries of V&W and LNV and the MNP. The project covers the review and assessment of international, European, national and interprovincial monitoring and reporting obligations and the associated activities concerning the environment, nature and water and makes proposals for more (cost) effective monitoring, reporting and data communication.

The study aimed at the *periodic* collection and reporting of data. Obligations for one-off reporting of financial aspects have been disregarded. The definition of monitoring employed is that it concerns *the periodic collection of data over a protracted period*. We do not consider short-term research programmes and enforcement and control activities as monitoring. In the event of uncertainty during the review, the criteria above have been generously interpreted to ensure that no reporting obligations or monitoring activities are missed.

The specific questions are:

1. How many reporting and monitoring obligations are there?
2. What is the nature, scope and origin of these obligations?
3. To what degree does the Netherlands meet obligations imposed by international treaties, the European Union and national legislation?
4. To what degree are reports actually utilised?
5. How efficient is implementation and are amendments desirable?
6. How much cost and effort does reporting and monitoring demand?

It became increasingly clear as the project progressed that determining the costs and efforts required by reporting and monitoring obligations was very difficult. It is therefore not possible using the material at hand to issue statements regarding cost effectiveness. The project is strongly focussed on statutory obligations, though it is clear that there are many more reasons to monitor, such as evaluating policy and identifying developments for the benefit of policy making.

Separate analyses were carried out for the themes of environment and water. The Environment Background Document describes the findings for the environmental themes. Furthermore, the nature themes use a summary from the Statutory Research Tasks – Information Provision Nature. The results can be seen on the following websites: www.milieurapportage.nl for the environment and water, and www.natuurgegevens.nl for nature. For environmental themes, the question as to what degree reported and collected data are actually utilised, and this data’s purpose and necessity, was analysed in greater detail using interviews and workshops with representatives of the various authorities and knowledge institutes.

As the project progressed, conditions changed. Policy implementation has recently received greater attention than in previous years, as is demonstrated by the newly published Future Environment Agenda and the Agenda for a Vital Countryside. The Netherlands has been confronted in recent years with the consequences of a number of European directives, such as those for nitrate (Fertilizer Policy), biodiversity (Habitat and Bird Directive), air quality and water. The issue of streamlining monitoring and data communication is a topical one, both at European Commission level and among national governmental authorities (Ministries of VROM, V&W, LNV). There are currently various activities in progress in this area. The provinces are developing the Province Monitor, which is partly aimed at ensuring coordination and uniformity in interprovincial monitoring activities. The multi-year programme the Agenda for a Vital Countryside follows the transfer of tasks, authority, budget and monitoring for rural areas from Government to Provincial level using the Investment Budget for Rural Areas. Working groups working towards harmonisation and coordination have been created for the various themes. These include the Working Group on Monitoring, Reporting and Evaluation (MRE) with relation to the Water Framework Directive, the Kwali-Tijd project (quality project) by the provinces for soil and groundwater monitoring and the Consultation Group on Air Monitoring (OLM).

The European Commission has created an expert group for the revision of the Standardised Reporting Directive (91/692) with the aim of creating a more streamlined, efficient and effective reporting system in the EU. This was one of Commissioner Wallström's ten priorities in 2002 and stemmed from the 6th Environmental Action Programme. This reporting programme has been discontinued for legislative reasons. However, the streamlining of monitoring and reporting obligations remains a core principle of European programmes like the Infrastructure for Spatial Information in Europe (INSPIRE) and Global Monitoring on Environment and Safety (GMES).

Reader's guide

This report initially considers the review of the number of reporting and monitoring obligations, see section 2. The European Union is an important source for many obligations. Section 3 discusses the use of European reports, the level of detail and the regulations for implementation. This is followed by a look at international obligations in section 4. The manner in which the Netherlands manages these obligations is dealt with in section 5, and then section 6 discusses the findings relative to implementation: how efficient is the Netherlands? Finally, section 7 provides essential recommendations.

The reviews, findings and recommendations for the separate environmental themes can be found in the Environment Background Document.

2. How many obligations are there?

The number of laws and regulations containing monitoring and reporting obligations depends on how they are counted. If the elaboration of a European Directive in daughter directives and of national laws in a General Administrative Order or ministerial regulations are not included, then the current review for ten environmental themes amounts to more than 50 laws and regulations containing one or more monitoring and/or reporting obligations (see table 1). This does not include subjects like health and the environment and policies concerning substances. Review of the nature theme reveals 21 laws and regulations, though it is striking that these are often related to international treaties. Water policy also attracts a large number (61) of mostly international and European obligations. It should be noted when interpreting these numbers that the summary says nothing about the *scope* of these reporting and monitoring obligations: one major reporting obligation can demand greater effort than ten minor reporting obligations put together.

Table 1 Legal and regulatory instruments with monitoring and/or reporting obligations. The column *national* also covers international and European legislation that has been converted into national legislation.

Theme	Level of application	International (excluding the European Union)	European Union	National	Total
1. Waste		2	13	3	18
2. Soil and groundwater quality and emissions		1	3	1 ¹	5
3. Soil decontamination		0	0	1	1
4. Greenhouse gases		1	2	1 ¹	4
5. Sustainable energy		0	1	1	2
6. External safety		0	1	2	3
7. Noise		0	1	2	3
8. Air emissions		3	9	1	13
9. Air quality		2	5	1	8
10. Environment-wide		1	0	1	2
Total Environment		10	33²	14	57
Total Nature		13	4	4	21
11. Water emissions		16	12	2	29 ²
12. Water quality (chemical)		15	16	2	32
13. Water quality (biological)		15	5	2	20
Total Water		38²	22²	2²	61²

¹ Still to be converted into national legislation and regulation.

² Excluding duplicates (certain regulation contains multiple themes).

The number of laws and treaties with monitoring and reporting obligations is the highest at a European level. That fewer reporting obligations are found at national level is due to the fact that they do not all require conversion into national legislation and regulation. For example, the provision in a European directive that member states send a report to the European Commission every three years does not require conversion into national legislation and regulation. European *regulations* are of direct effect and therefore also do not require conversion.

The reviewed legislation and regulation for the ten environmental themes reveals close to a hundred reporting obligations (see table 2). Most monitoring activities concerning the

environment are European obligations. Only soil quality and soil decontamination, and to a certain extent also external safety, are (still) not subject to European statutory monitoring obligations.

For nature, nearly sixty reporting obligations have been identified. Although nature reports aim to protect biodiversity and habitats, the definitions and concepts employed differ widely. For water, roughly sixty reporting obligations have been identified.

In reality, there is very little uncoordinated data-overlap between the various reports. Where this is the case, such as for waste, duplication is being eliminated at a European level.

Table 2 Number of reporting obligations: per theme, per level of application and per responsible authority

Level of application Theme	Internat. (excl. EU)	Euro- stat	Eur. com.	EEA	National			Inter- provincial	Total ²
Responsible authority	VROM / ministries	VROM / ministries			VROM / minist. / institutes	provinces		provinces	
Waste	1	2	15	0	2	1	0	0	20 ¹
Soil and groundwater quality and emissions	0	0	5	1	1	0	0	0	7
Soil decontamination	0	0	0	1	0	2	2	0	5
Greenhouse gases	2	0	3	1	0	0	0	0	4 ¹
Sustainable energy	1	1	1	0	1 ²	1	0	0	4 ¹
External safety	0	0	1	0	1 ²	1	2	0	5
Noise	1	1	3	0	3	3	2	0	12
Air emissions	3	0	14	2	0	1	1	0	19 ¹
Air quality	2	0	6	3	1	2	3	0	14
Environment-wide	1	0	0	0	2	0	0	1	4
Sub-total	11	4	48	8	11	11	10	1	
TOTAL ENVIRONMENT	11	55¹			32			1	93¹
TOTAL NATURE	35	21			4			0	59
TOTAL WATER	38	22			2			0	61

¹ Still to be converted into national legislation and regulation.

² Excluding possible duplications. Example: greenhouse gas reports must comply with the UNFCCC (international), the European Commission and the EEA.

³ Reporting obligations for different ministries have not been counted separately. Example: VROM and EZ both issue reports concerning the progress of the Management Agreement on the National Development of Wind Energy (BLOW), but these have been counted as one report obligation in the table.

3. European obligations: how detailed?

The European Union's environment, water and nature policy has two underlying principles. Firstly, there is the principle of a standard policy for all sources (production and products) in order to create a European market. The directives (with associated monitoring and reporting) related to source policy lead to equal Europe-wide efforts to reduce emissions. The other principle is that the European Union aims to provide all citizens (and ecosystems) with equal protection. Directives related to environmental quality (air, water, groundwater) therefore provide equal quality standards, the required efforts for which depend on the degree of pollution, exposure (population density) and types of nature encountered. Because sources are not evenly spread across the European regions, the quality requirements have different implications for each region and country.

The European Union's strongly thematic approach limits direct relationships between both types of directive and the associated obligations. In this way, it is mostly not possible to unequivocally link together the monitoring and reporting of environmental sources.

What the European Union does with the mountain of reports is not always clear. Various reports are combined into Europe-wide summaries by the European Environment Agency (EEA). In some cases, the EU uses the reports to ensure compliance with international obligations (i.e. greenhouse emissions). There might be some doubts about the purpose and necessity of a few reports. Member states are currently obliged to issue a monthly smog report, but there is no good reason why this should not be included in the annual air-quality report.

The EU only checks a limited number of countries for compliance to European obligations, though even in many of these cases these checks are scarcely possible since the significant differences in interpretation between member states makes assessment and comparison of the reported information exceedingly complex. For example, when establishing the concentration of PM10 particulates in the open air, some countries interpret the regulations very loosely (or they simply do not comply) so that they are no longer obliged to report non-compliance with the standards, and the EU does not feel the need to intervene.

Many European directives have been elaborated in guidance documents (air emissions and greenhouse gases) or in standardisation regulations for monitoring methods (CEN). These are mostly technical documents which enable the mutual comparison of countries' systems and working methods. These elaborations are often very extensive (i.e. the emissions manuals), and often just a few initiates are aware of the content and consequences.

Despite this detailed elaboration, the regulations and background documents often give the member states room to translate these laws into nation-specific efforts. The member states must then establish monitoring efforts using zero monitoring (Water and Groundwater Framework Directives) and pre-assessments (air quality). For this purpose, the Netherlands is divided into regions and conurbations for the benefit of the Air-Quality Framework Directive and in river basins and groundwater bodies for the benefit of the Water Framework Directive and the Groundwater Directive. The decision to settle for this spatial layout was made in the Netherlands, and partly determines the minimum required number of monitoring stations. Differences between countries are possible after all.

The directives sometimes use vague concepts, such as the notion of 'useful areas' in the Habitat Directive, or employ uncoordinated definitions in different directives ('surface water bodies' in the Water Framework Directive and 'receiving water' in the Urban Waste Water Directive).

4. Does the Netherlands have more international obligations?

Besides obligations originating from the European Union, they also stem from a number of international treaties, such as UNECE, OSPAR, IPCC and a large number of treaties about biodiversity (RAMSAR, Bonn, Bern, CBD, CITES, etc.). These treaties are binding. However, in a number of cases, these treaties leave room for various degrees of ambition. For air quality, for instance, the UNECE indicates three levels of ambition for monitoring efforts and, for reporting, OSPAR makes a distinction between compulsory and optional substances. It is not entirely clear which level has been chosen by the Netherlands.

Many treaty obligations overlap with European Union obligations for the Netherlands. The reason for this is that the European Union is also a party at these treaties and is therefore obliged to report as the EU. A large number of countries associated with UNECE have also become members of the European Union, which is why much effort is made to achieve policy coordination between both bodies. In a number of cases, effective coordination is still absent, so questions can still differ. International coordination is being pursued between EU, UNECE (acidic substances) emissions reports and the IPCC (greenhouse gases). And the Bird and Habitat Directive can be seen for example as the Europe-specific implementation of the globally-oriented Bonn and Bern treaties.

Reports to Eurostat, OECD and IEA are mostly not established in statutory regulation and are therefore not binding in those cases. Exceptions to this rule are formed by a few reports to Eurostat (waste matter statistics, joint questionnaire) that are established in European regulation.

5. Does the Netherlands do more or less than Europe demands?

The Netherlands already has a mature and extensive monitoring and reporting system. Many of these activities based on national policy have been replaced by European obligations. The idea that the Netherlands is a leader in environmental and nature policy within Europe has had repercussions on the execution of monitoring and reporting for a long time. The impression was that the Netherlands would not have any trouble with European obligations since they could easily be implemented within the existing structure.

However, experience with various themes over recent years has proven that Dutch environmental monitoring is not entirely Europe-proof after all. A perfect example of this is the rural air-quality monitoring network, which used to be a European leader, but is now very much a victim of the dialectics of progress. It is increasingly difficult to meet the demands of the EU using this monitoring network, while many other European countries that started later now have modern air-monitoring networks. Implementation of the Nitrate Directive is also becoming a stumbling block for the Netherlands. The discussion about the depth at which the Netherlands takes groundwater samples has recently been placed back on the agenda. The effect of sampling depth in the Netherlands was already studied when the monitoring networks were being established in the 80s. However, after the Netherlands had registered with the EU that the entire territory qualifies as vulnerable zone, and it emerged that the standards could no longer be consistently met, the sampling depth was investigated once again.

New environmental, nature and water standards are mostly generated at a European level. New standards require new, often additional, monitoring and reporting obligations, such as those for airborne particulate concentrations, the calculation of greenhouse gases, and the periodic assessment of environmental noise pollution and (agricultural) pesticides.

The review of monitoring and reporting activities suggests that, in a number of cases, monitoring is carried out in greater detail than is required by European regulation (table 3). For instance, the Air-Quality Act assesses local air quality in greater detail than would be the case on the basis of EU directives, certain waste sectors are monitored more frequently than required, emissions not requiring reporting are calculated for certain activities, and the Netherlands has in total more monitoring stations for groundwater quality than is deemed necessary by the European directives.

The review does not suggest that subjects or themes not originating from obligations of an international, European or national character should be monitored for environmental and water themes. However, nature's demands are different.

The conclusion that more monitoring and reporting takes place than is required by the EU must be a cautious one. As was indicated in the previous paragraph, more numerous and detailed reporting and monitoring obligations are sometimes demanded by the underlying EU documents than are suggested by the Directive alone. There may also be some doubt as to how flexible the rules are treated and whether they are indeed so generously interpreted as is thought. Moreover, European obligations are not the only reason to monitor and report.

Extra effort is being spent on supplying solutions to Dutch policy issues and to collect area-specific information (monitoring of surface water, groundwater in vulnerable zones, air quality in industrial areas). The argument here is that, besides a regional/provincial desire for more detailed information for policy and management objectives, the Netherlands has more

environmental issues as a result of its high population density. For this reason, the Netherlands is more active in this field than many other countries (who also fulfil their obligations), such as for the themes waste, soil decontamination, external safety, noise, air and soil quality. Otherwise, a review of the individual provincial requirements and obligations has not been carried out.

Table 3 Degree to which monitoring is obligatory and at which level of application.

Theme	Level of application	International (excl. EU)	EU	National	Interprovincial
1. Waste		+ (++) ¹	++	+	-
2. Soil and groundwater quality and emissions		-	++) ¹	-
3. Soil decontamination		-	- (++) ¹	+++	-
4. Greenhouse gases		+++	+++) ²	-
5. Sustainable energy		- (++) ¹	++	+	-
6. External safety		-	+	++	-
7. Noise		-	++	++	-
8. Air emissions		++	++	+	-
9. Air quality		+	++	++	-
10. Environment-wide		-	-	-	-
11. Nature		++	++	+	-
12. Water emissions		++	++	++	-
13. Water quality (chemical)		++	++	+	-
14. Water quality (biological)		++	++	-	-

+++ All monitoring is statutorily prescribed, so we do not monitor more than is required by law.

++ Most of the monitoring is statutorily compulsory, so we monitor more than is required by law.

+ Some monitoring activities are statutorily compulsory, so we monitor more than is required by law.

- No monitoring obligation.

¹ No *statutory* obligation, but international request / international agreement.

² Still to be established in national legislation and regulation.

At a national level, the Netherlands Environmental Assessment Agency (MNP) is legally obliged to supply environmental and nature information annually (Environmental Balance and Nature Balance). The MNP is dependent for this on data originating from existing third-party monitoring activities. The reduction or cessation of these activities can lead to non-conformity to MNP's legal obligations. The MNP has not specified its information requirements for all areas in relation to monitoring programmes. The MNP itself also commissions monitoring, although this is decreasing in volume.

A special national reporting obligation applying to all themes (but not included in the figures) is the compatibility law (and associated Government Performance and Results Act, or GPR) that contains requirements aimed at performance indicators that are to be included in the National Budget. It is up to the departments to establish which performance indicators are used to evaluate policy objectives, as the regulations do not specify which indicators these should be. In general, monitoring data is necessary for these indicators. The GPR requires, among other things, ensuring that the necessary performance data of the required quality is available in good time.

The performance indicators included in the departmental budgets are still being developed. Use is often made of data available from existing monitoring activities. The conscious selection of performance indicators that fit the policy objectives can give a better picture of the actual need for carrying out that monitoring. Where the need is related to international

obligations, this confirms the monitoring requirement. And where this is not the case, further research can be done into the benefit of the international obligatory monitoring requirement.

Recent National Budgets have included, per policy article, social effects indicators that are linked to general policy objectives. These indicators state whether social developments are progressing according to policy. A number of indicators are related to international obligations. LNV is attempting to link these indicators to the AVP indicators.

6. Is the execution efficient?

The interviews and workshops conducted indicate broad-based demand for an up-to-date summary of monitoring and reporting obligations. This study has led to an up-to-date summary. To avoid the need for further review at a later date, adequate and structural management of this information is required at www.milieurapportage.nl and www.natuurgegevens.nl.

The issue of streamlining monitoring and data communication is currently a widely-discussed hot topic, both at EU level and at EEA level, and also among national governmental authorities (DGM, V&W, LNV) and the provinces. There are currently various, mostly jointly-coordinated activities in progress.

Although the ministry of VROM is responsible (table 2), either alone or in cooperation with other ministries, for almost all reporting obligations relating to the environment (more than 70%), it is only involved directly in implementation for a single theme, the rest of the activities being outsourced to other authorities and knowledge institutes. The provinces are primarily responsible for about 10% of the reporting obligations, but are also charged by national legislation with the responsibility for the execution of many of the VROM's obligations, and carry out monitoring and reporting for seven environmental themes (table 4). Efficiency improvements may be achieved if both the provinces and the Government employ as often as possible the national knowledge institutes for implementation. The general picture suggests that implementation is reasonably efficient, but that improvement is certainly possible (see the detailed recommendations in the Environment Background Document).

Responsibility for most reporting obligations for nature falls to the Ministry of LNV. As with the environment, much of this is carried out by knowledge institutes. The special role played by the PGOs is particularly striking. The PGO is strictly speaking a knowledge institution that coordinates the activities of 17 nature monitoring networks within a collaborative venture including multiple ministries, planning agencies, provinces and the CBS. The CBS is actively involved in the processing of this data and ensures quality is safeguarded. The Gegevensautoriteit Natuur (Nature Data Authority) is currently being set up to better coordinate data collection for nature, and to guarantee the quality of this data. The provinces also have their own data files, including, for example, information concerning their own conservation-area plans.

Surface water is often monitored by both the government (Dept. of Public Works), the provinces (e.g. bathing water), and water boards as knowledge institutes (e.g. emissions). The parties are responsible for monitoring different waters (national waters, regional waters) and different themes (water quality, emissions), so these activities are seen as being mostly supplementary. The general picture suggests that implementation is reasonably efficient, but that improvement is certainly possible. The Water Framework Directive, for which monitoring programmes per river basin have to be constructed jointly by all the parties concerned, is a perfect example of this.

Table 4 Monitoring activities: implementing bodies

Theme	Implementing body	Dutch VROM ministry	Other Ministries	Knowledge and research institutes	Provinces	Municipalities
Waste			X	X	X	X
Soil and groundwater quality and emissions				X	X	
Soil decontamination				X	X	X
Greenhouse gases				X		
Sustainable energy		X	X	X	X	
External safety			X	X	X	X
Noise			X	X	X	X
Air emissions				X		
Air quality				X	X	X
Environment-wide				X	X	
Nature			X	X	X	
Water emissions				X		
Water quality (chemical)			X	X	X	X
Water quality (biological)			X	X	X	X

Nature data collection lacks coordination between the various international and national users for the data. While the basic data required to comply with the obligations is usually the same, multiple definitions are used, creating an unnecessary workload when supplying the data. The diverse nature-related monitoring networks (species and ecosystems) do not appear to provide adequate cover to meet the obligatory information requirements. In a number of cases, this relates to both the lack of indicator data and the degree of cover required of such data. Furthermore, various obligations leave room for free interpretations.

In a few cases, monitoring activities in the Netherlands are not mutually coordinated while they seem to cover the same subjects. Reconciliation would lead to greater efficiency. This applies for example to the perception of nuisance, for which both an MNP/TNO and a CBS survey exist.

The provinces, water boards and the government conduct monitoring activities for various environmental, nature and water themes. This is understandable where policy demands area-specific information. However, this does not always lead to an optimal monitoring system. The provincial monitoring efforts do not always conform to the European and national quality requirements. Research suggests that there are many doubts about the quality of provincial soil and groundwater monitoring data (see Kwali-Tijd project plan¹).

In the framework of the Agenda for a Vital Countryside, agreements are made between the government and the provinces about the monitoring of area-specific policy.

¹ The Kwali-Tijd project plan refers to the report on the *Integration of monitoring networks for soil and groundwater quality*, (TNO-NITG, 2001) and quotes: As far as the quality of monitoring-data is concerned, nowhere in the entire process of sampling, analysis, processing of analysis results, including the storage/management of monitoring data, does there appear to be (sufficient) safeguards. It is concluded that metadata (e.g. sample pre-treatment applied, analysis techniques, detection limits, etc.) is not longer retrievable and that non-chemical monitoring data (land owners) is not stored together with the monitoring data, meaning that it is often no longer possible to access.

For the monitoring of groundwater quality, the national monitoring network is sampled twice: once for the Water Framework Directive zero monitoring for a number of provinces (conducted simultaneously to the sampling of provincial monitoring locations), and once for the national monitoring network so that all the provinces are mutually comparable. Methodological variations for air quality sampling are also detectable between the regional monitoring networks and the national monitoring network, meaning that results may not be comparable.

This mediocre domestic coordination stands in striking contrast to the position of the Netherlands in Europe where optimum coordination is often demanded to enable comparison between member states.

The monitoring of water quality in terms of nature aims at the actual presence of certain sorts or types of nature, and the monitoring of water quality in terms of ecology aims at the preconditions for nature. Though mutual coordination might be expected here, these two data sets usually do not correspond well. Besides well-coordinated content, efficient execution of monitoring and controlling is particularly recommended for the monitoring for, on the one hand, the Water Framework Directive and, on the other hand, for the Bird and Habitat Directive (70% of the acreage indicated is water).

When drawing up the (also national) regulations, the exclusion of a section on monitoring was discovered (too) late to rectify it. One point for consideration is the timely involvement of the provinces and knowledge institutes in the preparation and revision of European regulations so that practical experience can be added and the workability of monitoring and reporting obligations can be checked in good time. The structure required for this timely involvement is already present when determining Dutch commitment to negotiations about new or revised European regulation.

In this way, for example, a coordinated reaction to the monitoring and reporting obligations of the European Soil Directive (that appeared in the autumn of 2006) was drawn up on the basis of current Dutch experience and the findings and recommendations from the Environment Background Document. This can be included in the Inter-departmental dossier team for Soil, so that a timely and well-coordinated and substantiated Dutch commitment can be realised on this point during negotiations in the Council.

By monitoring more than required by rules and legislation, often delivers a better quality of information. Conversely, in various cases, it appears that gaps arise, monitoring data is not made available (in a timely manner), and/or the required quality control is lacking. Examples of this are annual environmental reports and reports within the framework of the Dutch BOOM decree. This reduces the representativeness and quality of the information supplied.

In various cases, information collected on the basis of European or international obligations is eagerly employed at national and/or provincial level. One example where required information collected on the basis of European or international obligations is already employed at provincial level is waste. Better clarity and access to monitoring information can enable more extensive usage.

The review of monitoring and reporting obligations in this project has led to a large number of suggestions for improving efficiency per theme (see Environment Background Document). The Steering Committee on Environmental, Nature and Water Monitoring should follow up on this proposal.

7. Recommendations

1. Further research into the quality of the execution of monitoring and reporting obligations is necessary. This demands special attention when collecting data to the coordination and harmonisation of supply and demand. It is also desirable to better organise quality safeguards.
2. Consider per obligation what the scope of the required monitoring and reporting commitment is for European and international obligations, how much room for manoeuvre the obligations offer and explicitly investigate what level of ambition the Netherlands should choose. A comparison with the efforts of other European member states is advisable. Within this framework, the drafting of European (minimum) requirements for the quality of information is advocated. Additionally, it may then be considered whether there is demand from regional/provincial policy for even greater quality or degree of detail.
3. Strengthen interdepartmental collaboration in the field of monitoring where overlap in obligations and indicators is present. Negotiate interdepartmental agreements about the definitions and content of the policy indicators. The indicators of international obligations must be well-coordinated with the indicators from national policy and vice versa.
4. Review monitoring obligations and requirements for individual provincial policy and for the benefit of planning agency tasks and link these as much as possible to those of the government and international obligations.
5. Specify monitoring requirements resulting from the effect and performance indicators of the National Budget and link these as much as possible to those of the government and international obligations.
6. The Monitoring Steering Committee must play a role in coordinating (and controlling) the reporting obligations and monitoring activities, especially where multiple parties are involved. For example, between government and decentralised authorities.
7. The database and website that have been developed regarding monitoring and reporting obligations for the environment and water shall be maintained by the RIVM under the authority of the Steering Committee for the Environment, Nature and Water. The steering committee shall negotiate management agreements for information regarding nature monitoring and reporting.
8. The steering committee shall make proposals to better clarify monitoring information for the various authorities and for citizens, so that wider use can be made of data collected for the benefit of the EU or international treaties.
9. Research actual use, efficiency, purpose and need of monitoring and reporting obligations for water and nature, in accordance with the environmental themes approach. To gain greater insight into efficiency issues, it is necessary to create greater clarity in the costs associated with the provision of data.
10. Investigate whether efficiency benefits can be realised by considering the possibilities of employing the national knowledge institutes as much as possible to implement the provinces' monitoring obligations, the same as they do for the government.
11. Ensure the timely involvement of the provinces and, for the execution of monitoring, all parties concerned, when preparing and revising European regulation, so that issues can be diagnosed and addressed in good time. The instructions for Dutch representatives in international bodies must be adapted for this purpose, so that this information is included when determining Dutch commitment to negotiations over new or revised European regulation. The Netherlands must be more actively involved in Inspire in order to play a greater role in the European harmonisation of monitoring and reporting.

Towards Effective Monitoring

Environment background document

Annex 1

General findings and conclusions

1. Most monitoring efforts in the Netherlands are based on international and European obligations. Many national obligations are also derived from international and European legislation. Monitoring activities are being increasingly established in national legislation and regulation.
2. European regulations often only establish obligations in general terms and frequently fail to impose demands on implementation. In most cases, this gives member states room to apply their own interpretation to the monitoring efforts to be supplied, allowing for completion to varying degrees of detail.
3. The review performed does not suggest that subjects or themes not originating from obligations of an international, European or national character should also be monitored. However, monitoring is often more detailed than is strictly mandatory. The argument here is that, besides a regional/provincial desire for more detailed information, the Netherlands has more environmental issues as a result of its high population density. For this reason, the Netherlands is more active in this field than many other countries (who also fulfil their obligations). As far as is known (information is not available for all themes), this certainly applies in terms of waste, soil decontamination, external safety, noise, air and soil quality. However, provincial requirements and obligations have not been reviewed.
4. Monitoring more than required by rules and legislation, delivers a better quality of information. Conversely, in various cases, it appears that some organisations do not even provide the basic information and/or quality control required. Examples of this are annual environmental reports and reports within the framework of the Dutch BOOM decree. This reduces the representativeness and quality of the information supplied. However, apart from a few exceptions, there are no European or national quality standards for the information to be supplied.
5. As far as new international or European regulation is concerned, it would appear that existing monitoring activities in the Netherlands are often (more than) sufficient to ensure conformity to these international and/or European obligations. In a number of cases, expansion has proved necessary (including particulates, greenhouse emissions, agricultural pesticides/herbicides etc. and nitrate in the groundwater, the periodical charting of noise pollution). The Netherlands (still) does not conform to the European obligation to publish the emissions data of individual companies.
6. In various cases, information collated on the basis of European or international obligations is eagerly employed at national and/or provincial level. For instance, information supplied concerning waste in order to conform to European or international obligations is used at provincial level.
7. Monitoring activities often provide information for multiple reports. This means the monitoring burden is less than might be assumed from the large number of reporting obligations.
8. In practice, only a limited number of reporting obligations have been duplicated. However, various monitoring efforts have not been reconciled and are partially overlapping. Reconciliation would lead to greater efficiency. Concrete proposals are being made for this.
9. Although by far the most reporting obligations concerning the environment (77) are directed to/the responsibility of the Dutch VROM ministry, whether or not in cooperation with a number of other ministries, VROM is the joint implementing authority for just one theme and the bulk of the activities are outsourced to other authorities and knowledge institutes. The provinces are the primary contact for only 11

- reporting obligations, and carry out monitoring and reporting for 7 environmental themes. Efficiency improvements may be achieved if both the provinces and the Government employ the national knowledge institutes for implementation as often as possible.
10. At a national level, MNP is legally obliged to annually supply non-specified environmental information (Environmental Balance). This information has not been defined in all cases though. In performing this task, MNP has to rely on data originating from existing third-party monitoring activities. The reduction or cessation of these activities can lead to non-conformity to MNP's legal obligations. These third-party monitoring activities require MNP's involvement and/or co-partnership/co-management, and a more detailed definition of MNP's information requirements and wishes in terms of monitoring programmes. The Steering Committee can play an important role in the realisation of this involvement and management.
 11. The study performed demonstrates a broad-based demand for an up-to-date summary of monitoring and reporting obligations. This requires adequate and structural management of the KEFM database/website.
 12. Point of attention is the timely specification of the Dutch commitment during negotiations over new or amended European regulation, especially with regard to monitoring and reporting. When specifying this commitment, the early and active involvement of provinces (and also, where necessary, municipalities and/or water boards) must be guaranteed to enable the contribution of practical experience and the timely verification of the feasibility of monitoring and reporting obligations. Theoretically, the structure necessary for this early commitment is already available (as a BNC fiche, amongst other things), but would benefit from further elaboration and exploitation. A good example where other authorities have been involved at an early stage is the Thematic Strategy on Soil Protection, for which an interadministrative file team functions within the DUIV framework.
 13. Both European regulation and the provinces and regions are increasingly demanding the regionalisation of information relating to various environmental themes. This requires reshuffling and, where necessary, condensing at regional and local level of the information gathered.
 14. The issue of streamlining monitoring and data communication is currently a widely-discussed hot topic, both at European Commission (EC) and European Environment Agency (EEA) level, and among national governmental authorities (VROM, V&W, LNV). There are currently various, mostly jointly-coordinated activities in progress.

Recommendations

The findings are described in further detail in the theme-specific chapters of this Environment Background Document. Based on these findings and the general findings stated above, the following recommendations have been formulated. Further detailing and elaboration of these recommendations can be found in the theme-specific chapters.

General recommendations

12. For European and international obligations, consider per obligation the required quality of information (see general findings point 3 and 4), the degree improvement necessary and whether a lower quality would suffice. Within this framework, the drafting of European (minimum) requirements for the quality of information is advocated. Additionally, it may then be considered whether there is demand from regional/provincial policy for even greater quality or degree of detail.
13. Review monitoring obligations and requirements in terms of provincial policy, in addition to obligations based on international, European, national and interprovincial policy, the review of which is realised via this project.
14. Define the role of the Steering Committee with a view to the gathering of environmental information in order to conform to the general, non-specified obligations such as are

- established in the Dutch Environmental Protection Act, legislation with reference to RIVM and MNP (in the event of the annulment of specific obligations, these general obligations may be negated; in this framework, a further review of the monitoring demands of MNP would be worthwhile) and the Aarhus convention.
15. Define the role of the Steering Committee in relation to the structural content and technical management of the KEFM database/website (content management via editing committee; technical management and input by RIVM).
 16. As far as useful, consider the possible use, on a wider national and regional level than is now the case (see general finding no. 6), of data gathered on the basis of European or international obligations, and encourage this.
 17. Consider the possibilities of employing the national knowledge institutes as much as possible to implement the provinces' monitoring obligations, the same as they do for the government. Points of attention are the management form and the financial cover.
 18. Ensure proper interfacing between nature information (included in www.natuurgegevens.nl) and the environmental and water (and also partially nature-related) information included in the KEFM database, or include nature information fully in the KEFM database.
 19. Ensure that all authorities involved contribute actively and at an early stage (based on practical experience with and knowledge of the feasibility of monitoring and reporting obligations) to the definition of the Dutch commitment during negotiations over new or amended European regulation, especially with regard to monitoring and reporting.
 20. Give attention to demand for more region-specific information via reshuffling of existing information streams (e.g. for waste) and/or via a national base network with regional condensing where necessary (e.g. for soil and groundwater, air quality and air emissions and noise).
 21. Research actual use, efficiency, purpose and need of monitoring and reporting obligations for water and nature, in accordance with the environmental themes approach.
 22. Horizontal (i.e. pan-subject) attention to monitoring and reporting is and remains necessary in order to adequately act and react to the new European developments in streamlining and data communication.

Website/database recommendations

1. Steering Committee should set up an editing committee for the website www.milieurapportage.nl.
2. The www.milieurapportage.nl website should be expanded with hyperlinks to and inclusion of underlying digital files.
3. Interfacing www.milieurapportage.nl with the WOT Nature Information Facility database www.natuurgegevens.nl, to allow easy access of both environment and water, and nature information. A possible alternative might even be the complete inclusion of nature information in www.milieurapportage.nl.
4. Anticipate the results of European studies into data communication. In this context, proprietary requirements, wishes and opportunities need to be considered and then communicated to the European Commission and/or the European Environment Agency.

Waste substances recommendations

Adaptation of international regulation and other international (European) activities

1. Coordinate monitoring and reporting obligations on the basis of waste directives and the waste statistics regulation. The European Commission has announced that it is to draw up a proposal. Part of this is expected to be that packaging waste is included in the statistics regulation; if this is not the case, then the Netherlands will request this.
2. The EU has not established a quality requirement for the information to be supplied. Various other countries probably also conform to European obligations with relatively (much) less effort. Differences in quality also make mutual comparisons (benchmarking) difficult. It is recommended to draw attention to this problem at a Europe-wide level (via committees).

3. It would be worthwhile to initiate a discussion in the Netherlands and Europe concerning the question of whether other management approaches, such as a market regulated approach (e.g. waste as energy source), require different data. A good framework for this would be amendment of the Waste Framework Directive.

Adaptation of national regulation

1. A clear motivation for annual reporting (such as is currently done under the LAP) at a national level is lacking. Such a motivation could still be defined. Another option is to convert to biennial reporting.

Adapt implementation of monitoring and/or reporting

1. One point of interest is the EU's request to regionalise information. Theoretically, this does not have to result in more monitoring activities; it may be possible to get away with just reshuffling the gathered information.

Soil and groundwater quality and emissions recommendations

1. Research the optimal sample frequency of the soil-monitoring network in terms of the general quality objective.
2. Investigate the results of duplicating the National Monitoring Programme for the Effectiveness of Fertilizer Policy (LMM) for the quality of the information supplied; this partly with reference to the derogation request that lies at the heart of this duplication.
3. Coordinate various national and provincial soil-monitoring networks to enable mutual utilization of information (in the framework of the Kwali-Tijd project).
4. Coordinate and optimise existing groundwater-monitoring networks (deep and shallow) in connection with the Water Framework Directive (besides technical fine tuning, also possible realisation of a national base network with regional condensing); this can be implemented in terms of the Kwali-Tijd project.
5. Promote the intended construction of a meta-information system for soil and groundwater data (BIELLS) and the inclusion of not only national and provincial data, but also of third parties (such as municipalities, VEWIN/KIWA and water boards) in a base registration system (DINO-BIS).
6. Reduce the frequency of the CBS calculations of soil emissions from annually to once every three or four years (with the exception of nitrogen and phosphate-related emissions).
7. Consider how urban and point-source pollution can be included in the optimisation of soil and groundwater monitoring.
8. Draw up a fine-tuned reaction to the monitoring and reporting clauses in the European Soil Directive (expected Autumn 2006) on the basis of current Dutch practice and the findings and recommendations from this report, and include these in the Interdepartmental dossier team for Soil in order to realise a timely and well-coordinated and substantiated Dutch contribution on this point during negotiations with the Council.

Soil decontamination recommendations

1. Coordinate EEA report with information already available nationally (prevent extra data-collection).
2. Indicate what purpose extra information flows aligned with the EEA actually serve.
3. Refer also to recommendation 8 of *Soil and groundwater quality*.

Sustainable energy recommendations

1. Itemise on a provincial basis sustainable electricity data from the CBS, so that this can be employed by the provinces to assess their own performance.
2. National and provincial policy-makers must consider whether to draw up a monitoring system for sustainable heat generation. This is partly with an eye to the coming EU Heat Directive, in order to follow the development of this form of sustainable energy and adjust policy where necessary.

3. Itemise on a provincial basis energy efficiency data from various national bodies (SenterNovem, FO-I, VBE), so it can be employed by the provinces to assess their own performance.
4. Facilitate coordination between the various suppliers, with the aim of improving the coherence, coordination and coverage of monitoring activities relating to increasing energy efficiency.
5. Verify which data larger municipalities require to monitor the effects of their own sustainable energy policy. This should also include energy saving and CO₂-emissions reduction, as the objectives of energy and climate policy overlap, but lack clarity at the level of target group indicators.

External safety recommendations

1. Promote the developing trend of coordination between ministries and the various administrative bodies (seven competent authorities) to encourage a complete and consistent perception of external safety risks in the Netherlands (risk register, risk maps, risk atlases, Schiphol Safety Atlas etc).
2. Ensure an unambiguous survey of risks.
3. The VROM, provinces and RIVM must start a project aimed at organising a joint National Uniform Population Density Register.
4. Ensure that the Model Risk Map (MRM)/risk maps are accessible for GIS analyses and can be downloaded, so that these maps can be used for carrying out GIS analyses and as the basis of policy and for monitoring effects.
5. Also involve the emergency services (fire brigade, police etc.) in External Safety.

Noise recommendations

1. Discontinue reporting to OECD and Eurostat and consider from which EU countries information is still required for national policy.
2. Discontinue the CBS Noise Nuisance Survey since, partly as a result of the more extensive TNO/MNP survey, little use is made of it.
3. Give attention to the coordination and fine-tuning of monitoring activities in the framework of the European Environmental Noise Directive.
4. Further consideration is needed before deciding between SKM-1 and SKM-2 calculations.
5. Organise a national geographical database with information concerning applied sound-insulation, and other relevant traffic-related information (originating from decentralised authorities, among others).
6. Facilitate coordination between the monitoring of air quality and noise in terms of reporting frequency and moments, zone division and conurbations and the models to be used.

Air quality recommendations

Adaptation of international regulation

1. Encourage coordination between the Air (2006) and Noise (2008) Directives when evaluating these reports. Research also needs to be carried out into whether a biennial Air report is feasible.
2. Investigate whether it is more efficient (saves time) to limit Air Reporting to Brussels.
3. Investigate how the influence of varying weather conditions can be limited by (at least) employing average meteorological conditions in the Air Report.
4. Consult with the European Commission regarding the possibility of issuing the Ozone Report once a year in October to cover the period May to September.

Adaptation of national regulation

5. Adaptation of national regulation: Investigate whether sanctions are possible and desirable for non-reporting municipalities.

Adaptation of implementation

6. If measuring equipment requires replacement in the future, assess whether this investment is really necessary.

Noise and air quality recommendation

1. When evaluating the Air (2006) and Noise (2008) Directives, include coordination of both reports in terms of reporting frequency and moments, zone division and conurbations and the models to be used, among other aspects. Research also needs to be carried out into whether a biennial Air Report is feasible.

Air emissions and greenhouse gases (Climate change) recommendations

Adaptation of (inter)national regulation

1. The year 2006 is a good moment to investigate the obligation for issuing Environmental Reports. It is recommended that this should apply to a greater number of businesses and that less data should be requested (adapt format), and to investigate whether the validation of current Environmental Reports is adequate. Involve the Emissions Register (ER) when validating Environmental Reports, for example in an advisory role. This could enable greater coordination between national and regional figures and can lead to an improvement in the quality of the figures.
2. The ideal situation is to have one national report about air emissions. It may be advisable to investigate how this can be achieved over the long term.
3. IPPC Directive: Investigate the possibility of simplifying monitoring obligations in relation to industrial emissions. Implementation of the E-PRTR Protocol and revision of the IPPC Directive offer solid opportunities here.

Adaptation of implementation

4. It is recommended that a project be started for testing and assigning methodologies for monitoring substances indicated in the NEC Directive. The working method followed for greenhouse gases could also be applied here.
5. It would be advisable to investigate what the advantages (and disadvantages) might be to assuming 'fuel sold' in future emissions calculations instead of 'fuel consumed'.
6. The Netherlands should be actively involved in the revision of the EMEP Guidebook and Guidelines.
7. Investigate the possibility of a joint emissions register and how this might be done. This might be achieved by coordinating the Monitoring Steering Committee and the Emissions Registration Steering Committee. This coordination should lead to a clearer division of roles between the different parties.

Nature recommendation

1. Expand nature review in conformity to environmental review
2. Coordinate and link information in www.natuurgegevens.nl and www.milieurapportage.nl
3. Investigate the benefit, necessity of actual use, effectiveness and efficiency of nature reports (as carried out for the environmental reports).

Other recommendations

1. Carry out coordinating consultation between those responsible for environmental monitoring in the Netherlands. These terms of reference can be subsumed within the Steering Committee for Environment, Nature and Water Monitoring (in which the IPO, the ministries of VROM, LNV, V&W, the RIVM and the MNP all participate).

List of abbreviations**Annex 2**

AVP	Agenda for a Vital Countryside
BIELLS	Soil Information Essential for National and Local Government
BLOW	National Development of Wind Energy
BNC	Assessment of New Commission proposals
BOOM-besluit	Dutch Decree on Other Organic Fertilizers
CBS	Statistics Netherlands
DGM	Directorate-General for Environmental Management
DUIV	Consultation platform for the Director General of the VROM ministry, the Association of Water Boards (UWV), the Interprovincial Consultation Forum (IPO) and the Association of Netherlands Municipalities (VNG)
EEA	European Environment Agency
EMEP	European Monitoring and Evaluation Program
E-PRTR	European Pollutant Release Transfer Register
ER	Emissions Register
FO-I	Facilitation Organisation for Industry
IPPC	Integrated Pollution Prevention and Control
KEFM	towards Cost-Effective Monitoring
KIWA	Dutch Research and Knowledge Institute for Drinking Water, Wastewater and Related Ecological and Environmental Aspects
LAP	National Waste Management Plan
LMM	National Monitoring Programme for the Effectiveness of Fertilizer Policy
LNV	Dutch Ministry of Agriculture, Conservation and Fisheries
MNP	Netherlands Environmental Assessment Agency
MRE	Monitoring, Reporting and Evaluation
MRM	Model Risk Map
NEC directive	Directive on national emission ceilings
OLM	Consultation Group on Air Monitoring
PGO	Private Data Managing Organisations
RIVM	National Institute for Public Health and the Environment
SKM	method for noise calculations
TNO	Netherlands Organisation for Applied Scientific Research
V&W	Dutch Ministry of Transport & Public Works
VBE	Benchmarking Verification Agency
VEWIN	Association of Dutch Water Companies
VROM	Dutch Ministry for Housing, Spatial Planning and the Environment
WOT	Statutory Research Tasks