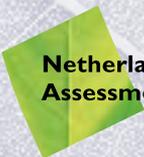


Summary
**The Netherlands in a
Sustainable World**

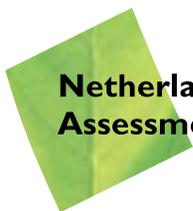


**Netherlands Environmental
Assessment Agency**

Summary

The Netherlands in a Sustainable World

Poverty, Climate and Biodiversity
Second Sustainability Outlook



**Netherlands Environmental
Assessment Agency**

The Netherlands in a Sustainable World, summary

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The Netherlands Environmental Assessment Agency (Het Milieu- en Natuurplanbureau: MNP) provides the Dutch government with independent evaluations and studies on the quality of the physical residential environment and its influence on people, plants and animals. In this, the MNP constitutes the bridge between science and policymaking.

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Introduction

The concept of sustainability

‘Sustainable development’ is a development that ‘meets the needs of the present generation without compromising the ability of future generations to meet their own needs.’

It was with this widely supported definition that the World Commission on Environment and Development (Brundtland Commission) put sustainable development on the world agenda 20 years ago. Sustainable development is concerned with both the presence and continuity of a particular quality of life in relation to the natural resources available to support this quality of life. For this reason we will have to take into account the effects of activities undertaken in the Netherlands here and now on the rest of the world, and in the future. If these effects are undesirable, achieving one goal will be at the expense of another. For example, the increasing use of biofuels will decrease the dependency on oil and – in principle – on the emissions of greenhouse gases. At the same time, biodiversity will, in this case, be negatively affected – directly or indirectly – by cutting down forest.

After identifying such trade-offs the question then arising is how to deal with them. There is no universal answer. In the first place, this will require the management of sustainable development to be dealt with more concretely, which is only possible if the context is thematic or domain-oriented. The collection of concrete objectives that incorporate sustainable development in the building and housing spheres will be described differently than the collection of concrete objectives for a sustainable food supply. In the second place, there are often differences of opinion in societies as to the desired course of action, and preferences may change in the course of time. Mediation between the various parties has to be built into the political process, where the role of scientists will be to provide insight into the available options and advice on the impacts of choices made.

Objectives and resulting actions are sustainable if they:

- are ecologically sound;
- have an economic and long-term perspective;
- result in just and stable social relationships.

Sustainable development can thus be better interpreted as a process of social objective-setting than as aspirations for achieving a specific result flanked by the society in question.

Second sustainability outlook

The core of the Dutch government's coalition agreement in 2006 was to pursue sustainability in human, environmental and economic development. At the request of the previous Cabinet, the Netherlands Environmental Assessment Agency (MNP) has now published a second sustainability outlook, following the publication of the first sustainability outlook (Quality and the future) by MNP in 2004 (summary available in English). This second outlook aims at bringing the present policy tasks into picture, with policy actions considered in an integrated framework. Both the first and second outlooks have been framed mainly from an ecological point of view. It still remains difficult to operationalise the concept of sustainability from a socio-cultural and economic angle. Sustainable development is considered in the second sustainability outlook from two perspectives: one focusing on the Netherlands in a sustainable world and the other on the Netherlands in the future, as outlined below.

The first perspective, as presented in the study, *The Netherlands in a Sustainable World* (to appear shortly in English), focuses on the relations between the Netherlands and the rest of the world. Central issues are poverty and development, climate change and biodiversity loss. Clearly, these global challenges cannot all be tackled at the same time or in isolation. Producing enough food for the world's population implies serious trade-offs regarding climate change and biodiversity. Only a robust international and coherent policy can strike a balance between fighting the war on poverty, tackling climate change and keeping biodiversity loss to a minimum.

The other perspective deals with the relationship of present to future, as presented in *Sustainable Netherlands* (to appear in English). This study focuses on the physical environment of the Netherlands in the future. Special attention is given to the coherence between policy tasks in housing, work, infrastructure, nature, landscape, water and climate change – areas which need to be simultaneously accommodated. Policy goals can only be integrated if management exerts its control at the right scale level, in this case the national level.

This summary highlights the main results and conclusions of *The Netherlands in a Sustainable World*. The outcome of this study, together with the findings from *Sustainable Netherlands*, can be used to structure the sustainability debate. It is the ambition of the current Dutch Cabinet to lead the national discussions on this issue.

The MNP is currently collaborating with other planning agencies and Statistics Netherlands to come up with a concise set of sustainability indicators. This will allow problems to be identified early on; furthermore, using the indicators will enable both policy makers and society to keep a finger on the pulse in sustainable development in the Netherlands.

Main conclusions

A finite world

The world is too small to simultaneously produce enough food for everyone, including meat, and to deliver biofuels on a large enough scale to slow down climate change and maintain biodiversity. Further economic development, particularly of the richer countries, and the emerging economies of China, India and Brazil, will be at the expense of biodiversity and will lead to further climate change. This part of the second sustainability outlook of the Netherlands Environmental Assessment Agency (MNP) revolves around three core sustainability issues: development, climate change and biodiversity loss. These are all closely interconnected, both in terms of causes and potential solutions. For example, socio-economic development of the poorest developing countries will lead to less poverty and famine, and in time, to lower rates of population growth, but also to higher levels of consumption and, consequently, to rising energy use and expanding land use, which in turn drive further climate change and loss of biodiversity.

Achievement of the current international objectives for development, climate change and biodiversity loss is becoming more and more unlikely. Important reasons for this are the one-sided emphasis in the short term, working with partial solutions and especially inadequate international cooperation. Reducing poverty, tackling climate change and reducing biodiversity loss to a minimum will only be possible with coordinated international policies. How this can be achieved is set out in the options below.

Promoting development

Although average incomes, and level of education and health have improved considerably during the last fifty years in most regions of the world, Sub-Saharan Africa and South Asia, in particular, are still lagging behind. Efforts to stimulate development in the poorest countries will have to concentrate primarily on the following:

- investing in infrastructure in the broadest sense of the word: education, health care, roads, factories, administration, energy, drinking water and sanitation;
- abolishing agricultural subsidies in combination with the phased opening up of markets in developing countries to allow these countries to adjust to the global market;
- combining existing development cooperation efforts to prevent fragmentation of the aid effort. A good example would be an EU plan for African development, in which the loss of biodiversity and natural habitat is kept to a minimum and energy is used efficiently.

Tackling climate change

Continuous availability of affordable and clean energy is an important element of sustainable development. Growing energy consumption during the last century was accompanied by a sharp rise in greenhouse gas emissions, resulting in more rapid climate change. The negative impacts of climate change will mainly affect developing countries. Tackling the climate problem effectively will necessitate:

- rich countries, the emerging economies (China, India, Russia) and the OPEC countries, joining an international climate regime;
- broadening the European emissions trading system to include other countries in tackling the global climate problem efficiently;
- encouraging the capture and storage of CO₂ at new coal-fired power stations and stimulating the use of alternative sources of energy through a system of subsidies and taxes, or enforcing their use through legislation until the emissions trading system provides an effective price incentive;
- lowering expectations about the contribution biofuels can make to the EU targets for 2020 and taking into account the negative impacts on food and biodiversity. Accelerating the development from first to second generation biofuels can reduce competition between food and energy cropping.

Conserving biodiversity

Population growth and rising consumption are increasing the pressures to convert natural areas into agricultural land, with a resulting loss of biodiversity. Development in Europe has been achieved at the expense of half the original biodiversity of the continent. In other regions too, socio-economic development has led to large-scale losses of biodiversity. It is certain that further economic development in the world will be accompanied by substantial biodiversity loss, especially in the tropical regions. The mission must be to limit the damage as much as possible, achievable by taking simultaneous actions to:

- raise agricultural productivity, particularly in developing countries;
- influence people's diet – although there seems to be little support for this at the moment – especially by encouraging them to eat either less meat (or at least less 'red' meat. i.e. beef) or high quality meat substitutes produced by alternative methods;
- reveal the impacts on biodiversity of production chains that involve processing natural resources, and remind the international business community of their responsibility in conserving biodiversity;
- provide targeted protection of ecosystems, particularly in tropical regions, supported by economic instruments and the establishment of sufficiently sized nature reserves;
- deepen and disseminate the understanding of biodiversity as a condition for development, following the example of the Intergovernmental Panel on Climate Change (IPCC).

Cost of achieving the objectives

A broad international agenda for tackling development issues is contained in the Millennium Development Goals (MDGs). One is to halve the figures for hunger and poverty in 2015 in relation to the 1990 levels. According to calculations, an annual contribution of about 0.5% of GDP from all donor countries will be required up to 2015, in addition to the efforts made by developing countries themselves and direct investments by companies. If we are to achieve the MDGs, other efforts besides financial contributions will be needed, such as good administration and effective arrangements for development cooperation. The costs of limiting average global warming to two degrees, amount to a few per cent of the global GDP in 2040. This is assuming that all the large countries participate and that economic instruments, such as emissions trading, are employed. If the total available emission rights for greenhouse gases were to be distributed equally across the

world's population, the policy challenge facing Europe would be relatively high and the costs would also be higher. According to the OECD *Baseline scenario*, by 2040 global GDP will have tripled in comparison with the 2005 level. It is not yet known what it will cost to substantially reduce biodiversity loss.

Resolving the social dilemma

Although the Dutch population considers it important to tackle global sustainability issues and is prepared to make a financial contribution, as individual consumers people often do not act accordingly. They think the government should resolve this social dilemma and prefer this to 'happen behind the scenes' in the creation of more sustainable products or production chains. Companies indicate that they are able and willing to produce more sustainably if government ensures a level international playing field. Countries face a similar problem and are often only willing to take action if other countries do so as well. Adapting and strengthening institutions and the ground rules for action are important conditions for sustainable development.

Coordinated international action

Sustainability issues need to be tackled not only through a robust international policy, but through an integrated approach as well. Development policies have consequences for biodiversity and climate change, and vice versa. Policies for energy, agriculture, trade, biodiversity and development cooperation should therefore be integrated. In pursuing this aim, the Netherlands should, via the European Union, promote a coalition of large countries, including rapidly growing economies. Finally, governments, such as in the Netherlands, could appraise the sustainability of its own policies and plans by consistently identifying and explaining their consequences, at least those concerning climate, biodiversity and poverty. This will alert politicians to the opportunities for countering or avoiding the negative consequences of policies and plans.

Summary

The Netherlands in a Sustainable World, describes the trends and policy options pursued in achieving internationally agreed objectives for development, climate change and biodiversity. The *Baseline scenario* up to 2040, developed by the OECD, was used here. A baseline scenario assumes no additional policies, such as the recently agreed EU climate policy. This outlook therefore also includes an inventory of additional policy options for working towards the objectives. The policy options identified were then analysed from the perspective of the different world views.

Trends

Much progress on development, but unequally distributed

The average income, level of education and health in most parts of the world have improved considerably during the last 50 years. However, a large proportion of the world's population still lives in extreme poverty, particularly in Sub-Saharan Africa and South Asia. Currently more than a billion of the 6 billion people on earth live on less than a dollar a day, 850 million people do not have enough food, more than a billion do not have access to clean drinking water and 2.4 billion people have no access to modern and clean forms of energy.

Development at the expense of nature and the environment

During the last hundred years in particular, human development has taken place at the expense of nature and the environment. Ecosystems and the climate have been the most affected. Humanity has already brought two-thirds of the world's productive land into use, mainly for agriculture, which has resulted in loss of biodiversity. In Europe, half the original biodiversity has already been lost. Rising energy consumption has led to higher greenhouse gas emissions, which, in turn, has caused a higher rate of climate change. Biodiversity loss and climate change constitute the ecological price of socio-economic development.

Population and consumption growth not compensated by technology: pressures on land and energy consumption continue to grow

The two main factors driving the increasing pressures on the environment are population growth and consumption. Consumption has risen in the rich countries of North America and Europe, but also in countries like China and Brazil. In the least developed countries, especially in Sub-Saharan Africa and South Asia, population numbers have grown considerably, but consumption has not. Rising incomes in these countries will in time lead to increasing consumption. Population growth is strongly influenced by socio-economic development, which leads to higher life expectancy, better education and improvements in the position of women in society. One consequence of this is a drop in the number of children per woman. While development does indeed lead to lower population growth, the rise in consumption has a greater effect, resulting in a net increase in the pressure on the environment. Population growth and increasing consumption lead to rising CO₂ emis-

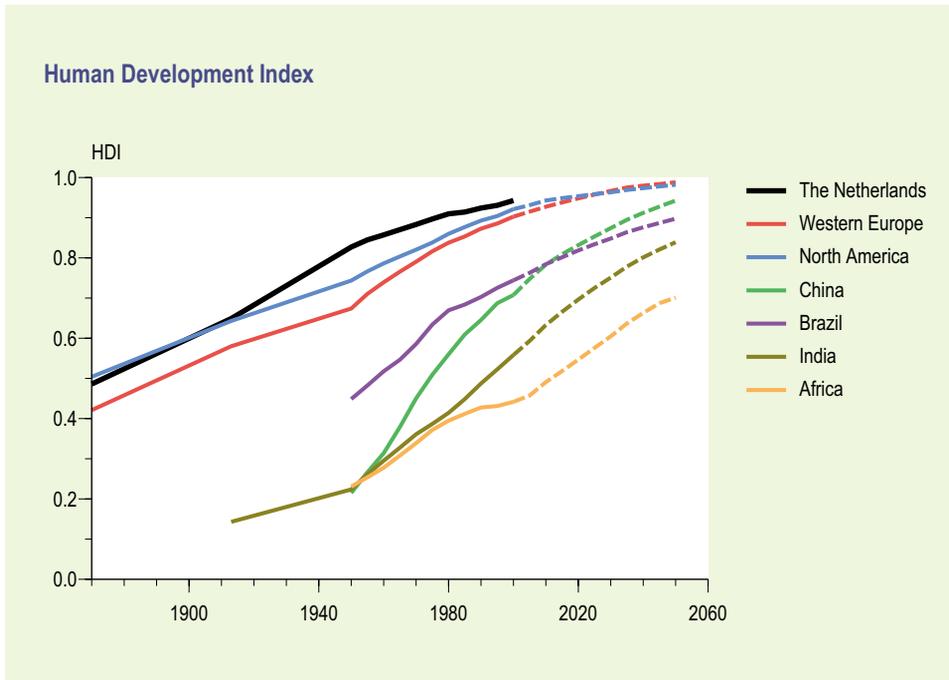


Figure 1 Humankind develops while Africa lags behind.

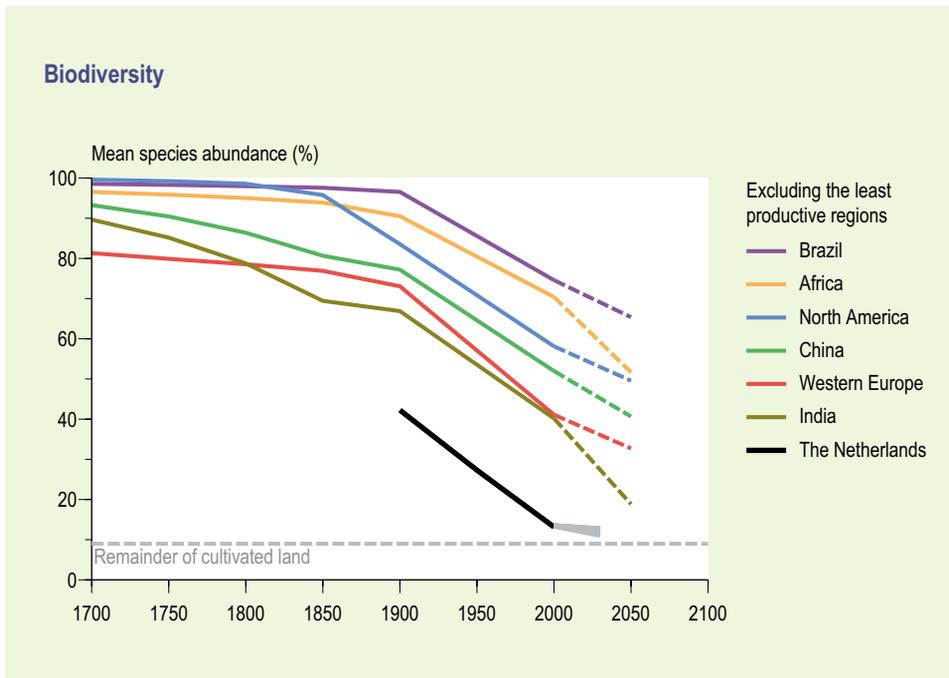


Figure 2 Loss of biodiversity continues.

sions and an increase in land use for development. Smart use of technology has made global production and consumption considerably more efficient, but the effect of this has not been sufficient to compensate for the global increase in energy and land use.

Trends: more people, more consumption and more competition for resources

If current trends continue there will be almost 9 billion people on earth in 2040; this is half as many again as today's world population. From 2050 to 2075 this world population is expected to rise gradually to a little more than 9 billion and decline thereafter. In the *Baseline scenario* income per capita of the global population more than doubles by 2040. As a consequence, consumption increases: people eat more meat, drive and fly more, and use more energy in the home. The living conditions of about a billion people in the developed world are what the remaining 5 billion aspire to, and this can already be seen in rapidly developing countries such as China and India. By 2040 energy consumption and land use per capita will have increased further in practically all countries.

Continued economic development in countries like China and India will intensify competition for raw materials and push prices up, which could heighten geopolitical tensions. As European gas reserves become exhausted in a few decades time, the continent's dependence on imports will increase from 30% in 2005 to more than 60% in 2050. The Middle East will assume an increasingly dominant role in oil production and Russia in gas production. This growing dependence will make the energy system more vulnerable, and there is a fear that energy suppliers will use their power for economic or political gain. To the extent that the declining security of supply is reflected in higher prices, the effects on the industrialised countries will remain limited. The security of supply problem is therefore less urgent than the climate problem.

Further biodiversity loss and climate change as consequence

The trends sketched above are accompanied by further loss of biodiversity and damage to useful ecosystem functions. Under the *Baseline scenario*, the total area of agricultural land in the world will expand by 10%, with all the additional land use occurring in the tropical and subtropical regions. This increase is envisaged without any additional policy interventions, including policies promoting biofuels. People in developing countries tend to be directly dependent on local ecosystems for their basic needs (food, water & fuel). If, with an eye to climate change and security of supply, biofuels were to be produced on a large scale in the short term, the demand for land, and therefore the pressure on biodiversity, would increase further.

As fossil fuels remain the dominant energy carriers in the *Baseline scenario*, CO₂ emissions rise from 28 Gigatonnes in 2005 to 47 Gigatonnes in 2040. The resulting higher concentration of greenhouse gases in the atmosphere will cause the average global temperature to rise. Developing countries are particularly sensitive to the expected resulting extreme weather conditions (long periods of drought and periods of heavy rainfall) because their economies are based on climate-sensitive sectors such as agriculture. These countries are also less able to take adaptation measures than the industrialised countries. In addition, damage to ecosystems will become more likely and the sea level will rise.

Climate, biodiversity and development objectives unattainable under current policies

The Millennium Development Goals (MDGs) for halving poverty and hunger will, on average, just be achieved by 2015. However, they will not be met in Sub-Saharan Africa and South Asia. Neither will the MDGs for health (child and maternal mortality & infectious diseases) be achieved, at least as a global average, under current policies. There is no concrete global target for climate change, but the EU has set a goal of limiting long-term temperature rise to no more than 2 degrees Celsius above the pre-industrial level. This will not be achieved without additional policy measures. The intended reduction in the rate of biodiversity loss before 2010 will in any case not be achieved, and the rate of loss will even accelerate without additional policy measures. Further global economic development will inevitably be accompanied by a substantial loss of biodiversity. The mission must be to limit the damage as much as possible. Humankind will not realise the current international objectives all at the same time, simply because planet earth is too small: food production, large-scale biofuel production and conservation of biodiversity are not compatible, certainly not in the short term. To achieve these objectives, or at least to make progress towards them, there will have to be a global turnaround in thinking and acting by both citizens and the business community alike, and a similar shift in policy.

CO₂ emissions and land use for Dutch consumption rising

The Netherlands is a small country and, in absolute terms, contributes only on a small scale to the global climate and biodiversity problem. But the relatively high incomes and accompanying levels of consumption in the Netherlands leads to CO₂ emissions per head of the population that are far above the global average. The area of land used for Dutch consumption per capita of the population is the same as the global average because most of this area is highly productive land in both the Netherlands and abroad. Without additional efforts, the CO₂ emissions and land use associated with Dutch consumption will increase further in the future. The greenhouse gas emissions arising from Dutch consumption per head of the population in 2040 will be five times higher than required to achieve the 2 degree target. If all people in the world were to use as much land through consumption as the average Dutch citizen, all the original 'green nature' would have disappeared by 2040. Dutch policies still pay little attention to the effects of consumption in the Netherlands on the pressures on the environment elsewhere in the world.

Citizens and companies look to government to enforce changes in behaviour

The average citizen considers it important that global sustainability issues are tackled, but as a consumer often does not act accordingly. The environmental pressure of consumption depends mainly on income and has no relationship with environmental awareness, values or preferred world view. People expect the government to take measures to resolve this social dilemma and bring about a change in behaviour. They can be stimulated to adapt their behaviour either indirectly, via financial incentives, or directly, by laying down normative standards.

Companies also look to government, primarily to secure a level playing field. Government can promote sustainable business practice by creating the right conditions, such as introducing supply-chain liability and making sustainability reports compulsory. In

addition, government can itself set a good example through its procurement policies and by rewarding vanguard companies, for example, by giving them a tax advantage. Requirements can be placed on production processes via the supply chain in public–private agreements with businesses and non-governmental organisations (NGOs). Given the relatively strong position of the Netherlands in global business networks, this can have a considerable impact. Besides this, various Dutch multinationals are already responding to the issues of development, working conditions, energy and biodiversity.

Sustainable development not yet key principle in guiding policies

Sustainable development is an important policy principle at the national, European and global levels, although at no level has a sustainability strategy been adopted that actually determines the direction of policy. The current best-case situation is one in which sustainability policy is shaped by a consideration of the impacts in other policy areas. In practice, however, this is seldom found, not even at European or national level. For example, the impact assessments carried out in the EU have to date been hardly concerned with impacts outside Europe. Given the interconnections between the main problems discussed in this outlook, sustainability policy should focus on the socio-economic development of developing countries, while at the same time limit climate change and biodiversity loss.

Options and prospects for action

Global sustainability problems require firm international agreements

The current trends can be changed by pursuing targeted policies. An important component of these policies is a robust international policy. However, to date there has not been a broad and powerful enough coalition of countries to achieve the objectives for climate, biodiversity and development. Neither have there been effective sanctions for enforcing agreements between countries. This makes it increasingly unlikely that poverty will be halved everywhere before 2015, that biodiversity loss will be significantly reduced by 2010 and that the temperature rise will be kept under 2 degrees.

Lowering the ambitions for biodiversity and climate, for example, by accepting further loss of biodiversity and a higher average temperature, can create opportunities for broad coalitions to effectively tackle these problems. The global community will then have to accept that in future additional adaptations will be necessary to cope with the consequences of biodiversity loss and climate change, with the additional costs of adaptation.

Firm international agreements imply compensation for developing countries

Currently, there appears to be a lack of international political will to make firm international agreements on the sustainability issues raised here and to provide the current institutions with binding and concrete policies. Possibilities for remedying this situation can be sought in various forms of compensation for countries who lose in a deal or are already lagging behind in their development, and in better coordination of policies for climate, biodiversity and development. Options for doing this are the transfer of agricul-

tural and energy technologies, and linking targeted funding to the protection of specific wildlife habitats and protected areas, particularly in tropical regions.

EU as powerful middle tier and the Netherlands can take the international lead

Global solutions are by far the most preferable options for global problems, but are difficult to realise in practice. *By negotiating at the global level the EU can harmonise issues to promote integrated solutions.* In doing so, the EU can aim for global agreement but can also work to form coalitions of smaller groups of countries. The EU would seem to be the most appropriate scale for the Netherlands, in terms of effectiveness and enforceability, for giving concrete shape to sustainable development.

The EU already takes exclusive responsibility for European trade policies crucial for international cooperation. Climate policy is also a European task, although not an exclusive one. As yet, the EU has much less control in the fields of development cooperation, energy policy and ‘external policy’, making it difficult to take an integrated approach to development, climate and biodiversity on the EU scale as a whole.

Via the EU, the Netherlands could promote the creation of an international coalition of the major countries, which could then make concrete and enforceable agreements for tackling climate change and biodiversity loss. Of course, adjustment of EU decision-making procedures would probably be required if progress is to be made, even with 27 member states. *Here is where the Netherlands could take a leading role – both within the EU and internationally – in forming coalitions by facilitating dialogue between the major global players.*

A broad, structural commitment to developing countries

Achieving the MDGs requires a structural approach to infrastructure development in the broadest sense of the word: investments in infrastructure, energy and telecommunications as well as drinking water, sanitation, education and health. Besides good governance, money is also a key ingredient for achieving this. As well as drawing on sources from the developing countries themselves and private funds via trade and investment by the business community, this funding will come from Official Development Assistance (ODA)

The search for robust solutions

This second sustainability outlook (*The Netherlands in a Sustainable World*) contains various policy options that can contribute to sustainable development. They will probably all be needed if we are to achieve the desired goals. The preferred objectives, options and policy instruments depend on the preferred underlying world view and political philosophy. Political movements have different preferences when it comes to the role of government and the market. These preferences also influence the question of whether international coordination or national independence and responsibility should be the dominant

modus operandi. Moreover, opinions are divided on the question of how government can best direct change: primarily via pricing policy or by regulation? This question is clarified in the use of the world views developed for the first sustainability outlook. Measures that are consistent with a world view, but entail risks when viewed from a different perspective, can be made more robust by pursuing flanking policies and compensatory measures to counter the identified risks. More robust solutions may be obtained by taking different normative views into account.

and debt relief. To achieve the MDGs, an annual sum amounting to about 0.5% of the GDP of the donor countries has been calculated as being required up to 2015.

In addition to more money, transfer of expertise is needed in the fields of infrastructure, health care, education, agricultural productivity and low-energy technologies or alternatives to fossil fuels. More coordinated allocation of ODA among donors and from donors to recipient countries would improve the current fragmented global effort. However, it would also involve combining funding streams, which would make results less visible for individual donors. In turn, this would make it difficult to pursue an evidence-based development policy, which is what the Netherlands is attempting to do. Public support for development assistance depends heavily on the visibility of the results.

Development policy out of solidarity and self-interest

The Netherlands can make a case for countries to raise their national ODA budgets not only out of solidarity, but also out of enlightened self-interest. This approach could, for example, prevent a flood of refugees from Africa by improving the prospects for the population. ODA budgets can also be used to improve investment conditions for the business communities in donor countries. Good governance in the recipient countries becomes more important in cases where ODA funds provide mutual benefits. In countries without good governance the poorest people remain dependent on hand-outs from NGOs or charitable organisations.

The Dutch government sees the MDGs as an important part of a wider sustainable development agenda. This agenda goes further than traditional development cooperation. One reason is that it envisages an extra commitment to sustainable growth and a fair distribution of resources, and another is that sustainable development is taken as the guiding principle, with special attention to sustainable energy. *This should be given concrete shape and substance in Dutch policy. In addition, the Netherlands can argue for further coordination of ODA and further integration with international climate and nature conservation policies.*

Towards an effective plan for the sustainable development of Africa

Economic development combined with the most efficient possible use of energy and a minimum loss of biodiversity and natural habitat could constitute the cornerstone of a Marshall Plan for Africa. This would also take its potential as producer of biofuels into account

Abolish agricultural subsidies and phase in trade liberalisation for developing countries

Further market liberalisation combined with targeted development assistance and investments can work out in favour of the population of developing countries. However, because producers in developing countries need time to learn and respond to international competition, and markets need time to develop, markets in developing countries should be opened up in stages. At the same time, fair competition on world markets requires the removal of the agricultural subsidies in the rich countries. These agricultural

subsidies harm developing countries most because agricultural exports are the only way most of them can access world markets.

Agricultural trade liberalisation demands flanking policies here and elsewhere

The Netherlands could press for a reduction in agricultural support within the EU.

Agricultural subsidies take up the lion's share of the EU budget, while trade barriers keep consumer prices high. In negotiations with the relevant major agricultural countries the abolition of agricultural support could be combined with agreements on tackling climate change and biodiversity loss, including the use of biofuels. Resistance by European farmers to scaling down agricultural subsidies can largely be dispelled by providing financial compensation for taking on landscape and habitat management tasks. Risks affecting the security of food supply can be dealt with by making agreements in advance on the action to be taken in case any hitches occur in the introduction of this regime. Conflicts can be dealt with via the WTO or the UN Security Council.

Climate policy needs a strong coalition and efficient mechanisms

A key requirement for pursuing a serious climate policy is cooperation between Europe and major countries such as the United States, China and India. Almost all the major countries of the world will have to participate this decade if we are to meet the European climate policy target of no more than 2 degrees average warming. Cooperation is needed because of the large amount of the required emission reductions, but also because the cheaper options tend to lie outside Europe. The costs of limiting average global warming to 2 degrees amount to a few per cent of global GDP in 2040, assuming, however, that all the major countries participate and that flexible mechanisms, such as emissions trading, are employed.

The allocation of emission rights is crucial for the success of such a system. Calls are being increasingly heard from the emerging industrial countries and developing countries for an equal allocation of carbon credits per capita throughout the world. *Given the importance of these countries as part of a future climate regime, the Netherlands could make a case for accommodating them when allocating emission rights.*

If the allocation of carbon credits is based on equal rights per capita, the financial burden of climate policy will fall largely on the industrialised countries because they will have to cut back most on their emissions. Current emissions by the poorest developing countries are not that different from what their allocation would be if emission rights per person were distributed equally across the world. These countries could even profit from climate policy by making use of cheaper reduction options and selling emission rights to the industrialised countries.

There are other ways to convince countries to participate besides via an acceptable allocation of emission rights. These include sharing the costs of transferring energy technologies and linking climate policy to other policy areas, such as development cooperation and trade liberalisation. However, even if other major countries join with Europe in pursuing climate policy, we must accept that not all the original goals (such as the EU's 2 degree target) may be achieved.

Extending and supplementing the European emissions trading system

In the absence of a global climate coalition, Europe has chosen to take unilateral action via the European Emission Trading System (ETS). This system is a good example of a market-driven climate policy. However, as long as the ETS remains limited to Europe, and a number of sectors within Europe (including transport) do not take part, the ETS alone will not be enough to achieve the climate target. The current price for a tonne of CO₂ is too low because the emission ceiling for Europe is not restrictive enough, and it is still not certain what will happen after 2012 when the current Kyoto agreements expire.

Because the ETS has not yet been fully taken up, extra instruments such as subsidies, taxes and additional EU legislation could be useful. Appropriate additional measures could be taken in the transport sector, for example, or aimed at domestic consumers. If, in addition to an emission ceiling, the government set additional standards for renewable energy and energy saving, the costs of climate policy would rise sharply. These costs can be justified if other goals than the climate target are involved, or if there is no confidence in the ability of the ETS to achieve the desired energy transition. Clearly, this would require more concrete targets for those other elements of sustainable energy provision, such as security of supply.

Climate policy options good for security of supply, but not vice versa

With current technologies it is possible to reduce greenhouse gas emissions sufficiently over the next 50 years to achieve the climate target. A sustainable energy economy

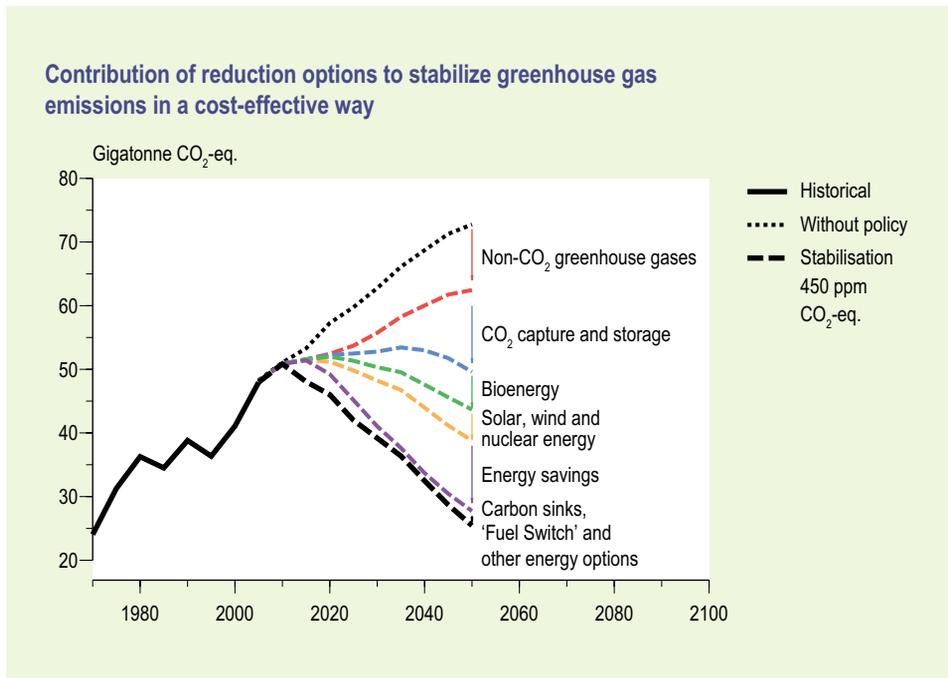


Figure 3 Limiting average global warming to two degrees can be achieved with existing technologies.

requires a broad pallet of clean energy options. Energy saving, renewable energy, nuclear energy (with acceptable solutions for accident and proliferation risks and storage of radioactive waste), and coal with carbon capture and storage (CCS), are robust options for climate policy that also improve security of supply. Options geared to reducing dependence on imports, however, do not always have a positive effect on greenhouse gas emissions.

Conditions for the use of coal

The future role of coal is crucial. If, in the interests of security of supply, society wants to continue to use coal as a source of energy, climate policy will require CCS as a minimum. Although the market will choose clean technology in an effective emissions trading system, the ETS so far provides no credible long-term incentive. The ramifications of decisions on the energy infrastructure last for decades: a coal-fired power station, for example, has a working life of at least 40 years. In the liberalised European energy market, however, it is not certain that CCS will be consistently applied. *The Netherlands can promote the use of CCS*. While taxes (on carbon) or subsidies (for technological development) can be used to stimulate CCS, an amendment to the Electricity Act will be needed to make the use of CCS compulsory.

Additional measures for an alternative energy supply

In the future we will need alternative forms of energy in addition to energy saving. At the end of this century fossil fuels, with the exception of coal, will have run their course. Existing options will then no longer meet our requirements and new technologies will have to play a major role in energy supply. Alternatives to the present energy system are both conceivable and available: e.g. solar, nuclear, coal with CCS, and wind and water. For example, under the current state-of-the-art solar power station technology, 0.3% of the area of the Sahara (about the size of the Netherlands) would be enough to meet the total EU demand for electricity. However, these options will require considerable investment and institutional change, while other options, such as nuclear fusion, remain highly uncertain. The vast sums of money involved and the high degree of uncertainty surrounding such options justify a coordinating role for government. These technologies can be brought a step closer and their costs reduced by setting standards for renewable energy and investing in research. The targets in the Dutch government's coalition agreement for energy-saving and the deployment of renewable energy sources can, in the long run, provide an impetus to the desired energy transition. However, in the period up to 2020, these goals look inconsistent with the aim of achieving the climate target in the most cost-effective way.

Considerable public support for climate policy in the Netherlands and the EU

There is considerable support for tackling climate change: doing nothing is simply not an option for the average citizen, even if other countries do nothing. The majority of the population in the Netherlands and other European countries support a policy to reduce CO₂ emissions by about 10%. They are also prepared to pay for this in the form of price increases. Citizens have a preference for measures outside their own private sphere, particularly for measures taken by the electricity generation industry and for energy saving measures by producers.

There is also support for energy saving by consumers, especially measures which pay for themselves. More than half the Dutch population think that a 10% increase in the price of new fuel-efficient cars is acceptable. This can be realised by setting CO₂ emission standards for vehicles. There is also wide public support for European standards and regulations for electrical appliances. Such European measures would have a worldwide effect via producers and products.

Revise expectations of the contribution biofuels can make to achieving the targets

Large-scale introduction of biofuels in the transport sector will be needed in order to achieve the EU target of 20% renewable energy by 2020 in a cost-effective way. This will require at least 15 million hectares of agricultural land within the EU (about 8% of the current crop area). This land will only become available if the European agricultural policy is revised and further liberalisation takes place. Up to 2020 only the first generation biofuels, which have a relatively low CO₂ efficiency, are likely to be available on a large scale. In a fully liberalised market many crops will be cultivated outside Europe, for example, in Brazil or Africa, because production in the tropics is cheaper, is more energy-efficient and requires less land. The first generation of biofuels can be produced cheaply in Brazil; in the EU, production is only possible with permanent subsidies. It is highly likely that the European target of 20% renewable energy can only be achieved with large-scale imports of biofuels. It therefore seems inevitable that in the short term first generation biofuels will have negative consequences for biodiversity, especially in tropical regions, and will drive up food prices. A second generation of biofuels will have to meet a number of strict criteria: they should not be cultivated on highly productive

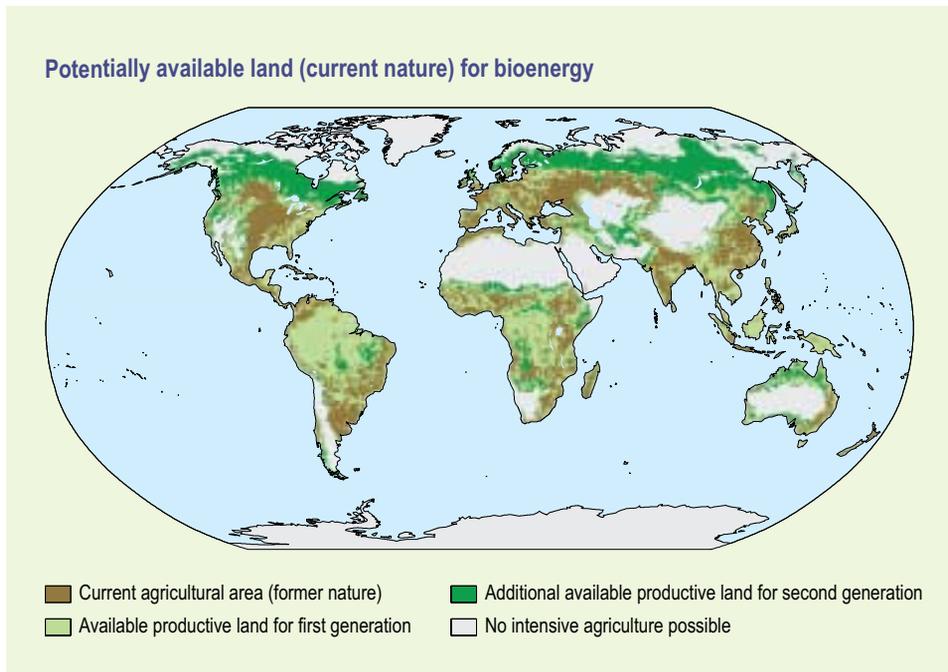


Figure 4 Tropical nature under pressure due to agricultural expansion.

agricultural land or in wildlife habitats and protected areas, and their cultivation should not involve additional irrigation water. It is questionable whether this is technically possible and economically feasible. In any case, the expected contribution by biofuels to the targets for 2020 will have to be toned down. A better alternative for the transport sector would be to develop more efficient engines. The transition from first to second generation biofuels will be crucial in the longer term.

Biodiversity conservation requires higher agricultural productivity, changes in diet and more nature reserves

An important option for combating biodiversity loss is to increase agricultural productivity. If agriculture does not become more productive, in 2040 all the available highly productive land will be under cultivation, including the current tropical (and rain) forest areas, as well as tropical grassland. Heavy investment in technological development is expected to lead to a substantial increase in agricultural productivity, but not enough to compensate for the rising demand for agricultural products. Increasing demand for agricultural products will inevitably lead to loss of biodiversity in Brazil and Africa, even if all currently available techniques are employed to the full. Technology alone will not be enough to achieve the biodiversity target.

Besides technology, efforts can be made to change people's diet. The worldwide growth in meat consumption is an important driver behind the increased demand for land. This growth can be curbed by reducing the amount of beef in the global diet and replacing it with a greater consumption of chicken and cereals. However, price incentives to bring about such a change in Western countries appear to have little effect in practice, and even if beef were twice as expensive, the land taken up for Dutch consumption would only be reduced by 4%. There is little support among citizens in the Netherlands and other countries for changing their diet (eating less meat) to scale down the continuing global loss of biodiversity and natural habitat. There is more support for investments in technology than for changes in behaviour, even if these technologies are controversial, such as genetic modification.

In view of this, creating more nature reserves seems to be a necessary option. Provided they are well managed and funded, nature reserves are an effective instrument for protecting specific ecosystems, especially in tropical regions.

Biodiversity conservation also requires transfer of expertise and funds, along with greater public support

In addition to the transfer of knowledge and technology for increasing local agricultural productivity, the protection of specific nature conservation areas has to be financed. Nature protection outside the EU stands or falls on the possibilities for compensating those who depend on protection of nature areas for their livelihood. One condition is that ownership rights in countries with large nature areas are clearly defined and legally protected. *The Dutch government, companies and NGOs can weigh up the possibilities of bearing the costs of managing valuable nature areas in anticipation of a global biodiversity conservation plan.*

The Netherlands can also call for increasing knowledge and understanding of biodiversity, particularly the exploitation of biodiversity as a source of prosperity, development and future applications (such as new medicines). The job of pulling together the necessary knowledge and making it accessible to the public and politicians might be given to a network organisation like the Intergovernmental Panel on Climate Change (IPCC). Such an agency will also be necessary to broaden support for biodiversity policy. At the moment most citizens see no direct relationship between their consumption of meat and dairy products, and its impact in terms of land use and biodiversity loss.

Change consumer behaviour, preferably by making production chains more sustainable

At the moment changes in consumer behaviour are not occurring on a large enough scale to have a substantial impact on climate change, biodiversity loss, fair pricing and acceptable working conditions. Opinions are divided on the desirability and possibilities for behavioural change. Provision of information, labelling and raising awareness of the ecological footprint is fine, but there is a fear that government will be seen to be patronising. Direct standard-setting for consumer behaviour by citizens, for example, in the form of quotas for vehicle kilometres or amount of meat consumed, is not feasible in the short term. Meat or fuel pricing at realistic levels has little effect on consumer behaviour in rich countries like the Netherlands because these items account for just a small proportion of total income, but it can serve as a source of funding for nature conservation. People's behaviour can also be influenced indirectly. Subsidies and taxes make sustainable behaviour more attractive and can therefore help consumers to make their behaviour more sustainable.

Citizens generally prefer the government to ensure that products are manufactured in the most sustainable way possible and that it pursues policies for making production chains more sustainable without consumers having to change their consumer behaviour. They prefer to see technical measures made obligatory. Companies indicate that they can and are willing to produce more sustainably if government ensures a level international playing field. In addition, government can require companies or sectors to report on environmental pressures and working conditions throughout the whole production chain, including activities in countries which have less stringent environmental regulations. A promising option that is already being applied in a number of production and supply chains is to make international agreements between the business sector, NGOs and governments, starting with the most damaging product groups. Care should be taken to prevent verification costs falling on developing countries to avoid impeding their access to the market.

Sustainability assessment of policy plans with a view to ensuring policy coherence

In its coalition agreement the Dutch government emphasises the importance of policy coherence. Through active international engagement the Netherlands wants to contribute to a competitive domestic economy and to development elsewhere in the world, as well as to a more sustainable living environment both in the Netherlands and abroad. Sustainability policy implies that decisions taken here and now do not unnecessarily contribute to increasing problems elsewhere and later. It is all about striking a balance between

economic interests here and now, improving global income distribution in the medium term and reducing ecological risks on a global scale for the remainder of this century. *The Netherlands and other countries could therefore introduce a simple sustainability assessment for policy plans designed to identify – in a consistent manner – the impacts of policy proposals on climate change, biodiversity, poverty throughout the world, and the loss of income and employment at home.* The aim here is to prevent unnecessary loss and provide an evidence base for proposing flanking measures to compensate for the negative impacts. This would allow policy options to be weighed up and appraised in a consistent manner within a broad and integrated context.

Core table

The core table below shows relevant trends for various countries during the last 35 years and how these trends will develop over the next 35 years (up to 2040) according to the OECD's *Baseline scenario*. The figures for 2040 are given to bring the policy challenge into focus.

Baseline scenarios are based on the assumptions of no major policy shifts in future and no additional policies, such as the recently agreed EU climate policy, which is not included.

1970	Population		GDP		Greenhouse gases		Remaining biodiversity
	Residents (x billion)	%	Dollars (x billion)	%	CO ₂ eq. (Gigatonne)	%	%
EU	0.35	9	4,250	28	4.4	18	50
US	0.21	6	3,500	23	5.5	23	66
China	0.87	23	500	3	1.6	7	75
India	0.57	15	580	4	1.2	5	61
Brazil	0.10	3	340	2	0.5	2	80
World	3.79	100	15,020	100	24.0	100	78

2005	Population		GDP		Greenhouse gases		Remaining biodiversity
	Residents (x billion)	%	Dollars (x billion)	%	CO ₂ eq. (Gigatonne)	%	%
EU	0.40	6	9,590	20	4.4	9	46
US	0.29	4	10,040	20	7.9	16	62
China	1.33	20	7,140	15	7.8	16	63
India	1.09	17	3,040	6	3.9	8	46
Brazil	0.18	3	1,280	3	1.5	3	74
World	6.49	100	49,130	100	48.6	100	72

2040	Population		GDP		Greenhouse gases		Remaining biodiversity
	Residents (x billion)	%	Dollars (x billion)	%	CO ₂ eq. (Gigatonne)	%	%
EU	0.40	5	18,460	12	5.2	7	39
US	0.37	4	24,020	16	10.1	15	55
China	1.44	17	34,060	22	13.2	19	57
India	1.52	17	15,740	10	7.1	10	27
Brazil	0.24	3	3,190	2	1.8	3	68
World	8.74	100	151,660	100	69.6	100	64

– GDP in billions of dollars and 1995 prices
– Greenhouse gas emissions for all sources, including energy-related emissions and emissions from land use
– Human Development Index (HDI): income, education and life expectancy

Table 1 Trends in population, GDP, greenhouse gases and remaining biodiversity in 1970, 2005 and 2040 (2040 according to the OECD *Baseline scenario*).

The Netherlands in a Sustainable World

How has the world changed during the last 20 years after the publication of *Our Common Future* by the Brundtland Commission, and after the United Nations issued the Rio Declaration on Environment and Development in 1992? Many people have seen considerable improvements in their income, health and level of education. But poverty has not been eradicated, global warming caused by greenhouse gas emissions is still unavoidable, and the rate of biodiversity loss is increasing.

The Netherlands in a Sustainable World (second sustainability outlook) is about what needs to be done to tackle these problems of sustainability, and what specific contribution can be made by the Netherlands. In its coalition agreement, the Dutch government stated its ambition to make the world a better place. Although this is not a simple task, this book presents sufficient options for fighting poverty, tackling climate change and limiting the loss of biodiversity. Within the context of a coherent international approach, forming an important condition for meeting the challenges posed, the Netherlands can make a significant contribution to global sustainable development.

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