Memorandum for policy discussion

Make room
for the climate!
Initial steps towards a national adaptation strategy

Ministry of Housing, Spatial Planning and the Environment (VROM)
Ministry of Transport, Public Works and Water Management (V&W)
Ministry of Agriculture, Nature and Food Quality (LNV)
Ministry of Economic Affairs (EZ)
Association of Provincial Authorities (IPO)
Association of Netherlands Municipalities (VNG)
Association of Water Boards (UvW)

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Positioning

This memorandum sets out the main points of a national strategy for adapting to the consequences of climate change. This memorandum is the first result of ARK, the National Programme for the Adaptation of Space and Climate. In this programme, the Ministry of Housing, Spatial Planning and the Environment (VROM), Ministry of Transport, Public Works and Water Management (V&W), Ministry of Agriculture, Nature and Food Quality (LNV) and Ministry of Economic Affairs (EZ) are working together with the Association of Provincial Authorities (IPO), Association of Netherlands Municipalities (VNG) and Association of Water Boards (UvW). In this programme, these collaborative parties each have their own political responsibility for their own policy areas, plans and projects, which are incorporated into this strategy.

This memorandum has been drawn up for a round of policy discussions. The Dutch Cabinet will incorporate the results of this consultation process when they draw up the National Adaptation Strategy this autumn. Over the coming months, the strategy will be worked out in more detail and will also take into account the preliminary and definitive findings of a number of current and new research and policy development projects, including:
- the WLO (Welfare, Prosperity and Quality of the Living Environment) scenario study drawn up by the Netherlands Bureau for Economic Policy Analysis (CPB), Netherlands Environmental Assessment Agency (MNP) and Netherlands Institute for Spatial Research (RPB);
- the MNP research project Nederland Later (The Netherlands of the Future);
- the EU Green Paper on adapting to climate change;
- the exploration of potential policy on Water Management in the 21st Century (WV21);
- the Kustvisie (Vision of the Coast); and
- the VERON study of the economic and spatial development of the North Sea region.

In addition, the debate in response to the motions submitted by members of Parliament Bochove and Depla (regarding the benefits of and need for the adaptation of investments in areas that in the worst case climate scenario could face serious threats before the end of this century) and by Samson and Spies (involving a request for an agenda of the measures needed to prepare for the now unavoidable changes to our climate) expected to take place this summer will make a significant contribution to the adaptation strategy. The results of this round of discussions and of the discussion with the Dutch Lower House of Parliament will provide key input for the further development of policy by the Cabinet in such areas as the adaptation of water management and spatial planning policy as the result of climate change.
Make room for the climate!

In the coming centuries, we will see tremendous changes in our climate. Rising sea levels, greater river discharge volumes and periods of extreme precipitation will greatly affect the river area and the low-lying coastal areas. The increasing threat of floods makes our country one of the most vulnerable regions in Europe.

Specific, tangible measures are needed to ensure that the Netherlands remains safe and habitable. We will have to minimise greenhouse gas emissions in order to limit the rate and extent of these changes. However, we won’t be able to prevent several major shifts in the global climate system. Adaptation is unavoidable.

We have to making changes right now. We will need to be innovative and creative in order to control the risks and create opportunities. A crucial aspect of this will be that public authorities, the business community, NGOs and the scientific community will have to work together. A safe and attractive living environment is also essential if the Netherlands wishes to remain an attractive business location.

Making the Netherlands ‘climate proof’ will be one of the greatest challenges facing Dutch spatial planning policy in the 21st century. This task will increasingly determine short- and long-term investment decisions. Sustainable spatial planning development minimises the consequences of climate change, capitalises on opportunities and lays the foundation for well-balanced social, ecological and economic development. In short: People, Planet, Profit!
A sustainably safe, secure and habitable Netherlands

The climate is changing. The impact of this can be seen all over the world. The rate of change seems to have accelerated in recent years too. We will have to adapt to these changes. The longer we wait to take action, the fewer sustainable options we will have. By investing in the future now, we will avoid having to implement very expensive and far-reaching social solutions later on. In a densely populated and economically prosperous delta area such as the Netherlands, even increases in spatial planning investments make climate change more likely. For this reason, too, we need to take action and quickly. A dynamic start to our programme of change offers us more options for coordination with current projects (“project coordination”).

What awaits us? Overheated cities, waterlogging, droughts causing damage to the agricultural sector and the environment, and an increased fear of flooding: is this the Netherlands in a year’s time or fifty? Remember, it doesn’t have to become reality provided we take measures now to adapt to the changing climate. Anticipating climate change also creates market opportunities. The predicted changes in climate offer opportunities to improve the competitiveness of our agricultural sector and long hot summers will attract tourists, whilst innovations in water management will consolidate our international reputation.

A changing climate requires a shift in thinking

If we wish to remain in good health in a prosperous economy in a safe country, we will have to adapt. We must take better account of the risk of climate change and capitalise on opportunities. This requires a change in thinking, taking action and allowing things to run their course.

This shift will not happen by itself. The tasks are complex, the solutions are often far-reaching and it is unclear to what extent and how quickly the climate is changing. The public authorities, the business community, NGOs and citizens will have to take the initiative and actively work together. Each of us holds part of the solution in our hands. We will have to take our own responsibilities and perspective of the role we play and use them as a basis for the formulation of ambitious goals that meet this challenge. The national adaptation strategy provides the national framework for this, representing the initial step towards placing political and policy decisions on the agenda.

An integrated and area-oriented approach is essential. If offers the various parties a logical framework for coordinating objectives and interests. For example, it is both more effective and more efficient to jointly address dike reinforcement, investment in nature and the development of recreational opportunities. Project coordination creates the best opportunities for achieving an attractive spatial plan for our country. In this way, we will be able to improve the quality of the Netherlands’ spatial planning and further bolster our image as a delta area that is an internationally attractive, safe and secure business location, including from an environmental point of view.
Consequences for the Netherlands

The scenarios recently published by the Royal Netherlands Meteorological Institute (KNMI) indicate that on average, winters in the future will become warmer and summers will become warmer and drier. The likelihood of experiencing a prolonged period of (extremely) high temperatures or an intense rainstorm is increasing. By the end of this century, the sea level will rise between 35 and 85 cm. Annual rainfall will increase. During the winter, we will have to deal with greater discharge volumes from the major rivers. We are also more likely to experience water shortages in the summer.

Flood protection
Both a sea level rise of up to 1 to 1.5 metres per century and a total increase of 6 to 7 metres after several centuries appear to be technically manageable at a socially acceptable cost. For the time being, the KNMI scenarios mentioned above serve as the basis for flood protection policy. Provisional results from the MNP study Nederland Later (The Netherlands of the Future) indicate that a rise in sea levels will over time create problems with the natural discharge volumes from the major rivers and increase artesian pressure in low-lying areas.

Living environment
In urban environments, the increasing likelihood of prolonged periods of extreme temperatures can lead to ‘heat wave stress’ as the result of a lack of sufficient protection and ‘cooling off’ options and a lack of adequate heat-absorbing and heat-removal capacity. Extreme rainfall can quickly lead to large-scale flooding and damage.

Biodiversity
Rising temperatures and a changing water management system will lead to the migration of species. Certain species will disappear from the Netherlands. Existing unique ecosystems will be under threat. New, more general species will become more prevalent. The best opportunities for new ecosystems exist in low and wet areas of our country. The increasing salination also constitutes a threat to existing species, but does offer opportunities for new species.

The economy
Extreme weather conditions can lead to the disruption and breakdown of transport and energy networks. This can threaten the accessibility and operation of essential facilities, mainports and economic centres. Drought and freshwater shortages can harm our agricultural sector. Long, warmer summers are good for the farming, recreational and tourist sectors.
Resistance, resilience and adaptability

The climate is changing. That much is certain. The trend in climate change is also clear. The only things we don’t know are the precise rate and final extent of the changes. Against this background, the hallmarks of our climate-proof policy must be resistance, resilience and adaptability. Resistance is needed in order to be able to cope with extreme conditions. Resilience is required in order to be able to recover quickly as soon as conditions return to normal. Finally, uncertainty, in particular about the rate and extent of climate change, requires good adaptability.

The Dutch coastal defence system, for example, reflects high resistance and low resilience. It can withstand a minor rise in sea level and an increase in violent storms, but when the system does give way, it will be take a lot of time before it returns to its original condition. In contrast, the cooling systems of power plants reflect low resistance and high resilience. It will fail whenever the temperature of the river water rises, but will function normally again as soon as the temperature has fallen. By setting aside space for measures that may become necessary in the medium term and by having plans in place in the event of an unexpected acceleration of the rate of climate change increases our adaptability.

In order to achieve the necessary climate-proof qualities (i.e. resistance, resilience and adaptability), we will have to gradually adapt the Netherlands’ spatial planning. In the future, we will have to take the above three characteristics explicitly and consistently into account when planning, designating, and managing land.

How will we manage uncertainty?

In 2006, the KNMI developed four model scenarios for the future. These climate scenarios present a range of the most likely developments, although there is no certainty that they will occur. They do, however, facilitate decision-making and planning for uncertainty. We will take these climate scenarios into account for all spatial planning investments. A cost-benefit analysis on a case-by-case basis will indicate which investments are needed immediately and which measures could also be implemented at a later date. For specific investment decisions, this and other information will be used to make policy-based decisions regarding the selection and spatial planning of geographical areas.

The irreversible nature of large-scale spatial planning investments and the high cost of subsequent alterations mean that they have to be assessed with a view to climate change that is potentially more rapid and more severe than the current scenarios forecast. Together with the KNMI and other planning agencies, the Dutch government will investigate the likelihood and consequences of more extreme conditions in respect of a number of strategic and sectoral issues yet to be selected. Here, too, a cost-benefit analysis is required to assess various options on the basis of financial viability and public support.
What will guide us?
The coalition agreement states that adapting to the consequences of climatic developments will play a prominent role in future spatial planning trends. Water management policy will play an increasingly important role in this respect. Climate change predictions will largely determine strategic policy decisions and investment decisions. Managing uncertainty and reducing our vulnerability to extreme conditions will be of key importance here, the two key principles being risk control and the recovery of natural processes.

Risk control
It is becoming increasingly clear that absolute safety and security can never be guaranteed. After all, it is always a possibility that dikes or dunes will be breached somewhere or that unexpected extreme weather will lead to road or rail traffic being brought to a standstill. We do not know precisely how extreme the weather conditions in the Netherlands will become. Risk control (risk = probability x consequence) not only means that we must prevent all undesirable developments and minimise the likelihood of a failure, but also that we must take action to limit damage and the number of victims. Making the right spatial planning decisions can help us achieve this goal. For instance, compartmentalisation can help to control a flood and thus to limit the damage and number of people affected. In this situation, only part (a single compartment) – not all – of a dike ring is affected. Furthermore, essential or vulnerable functions must be situated in places where the likelihood of a disaster is extremely small. Other examples of risk control include changing over to different, more climate-proof crops in farming, and developing ‘flow-through’ residential districts and industrial estates.

Natural processes
Prudent use of the natural properties of soil, water and air reduces vulnerability and increases the adaptability of areas. Natural processes – together with technical measures – make sustainable spatial planning possible. Ruimte voor de Rivier (Space for the River) and offshore sand nourishment efforts are examples of programmes where natural mechanisms can be used to reduce the risk of flooding. If a city is suffering from extreme heat, both small- and large-scale areas of water and nature will help to cool them down. Site location and the spatial planning of areas should also bear in mind the quality and vulnerability of the subsoil. We will need to focus more on the adverse effects of asphalting, which include warming, drying out and flooding.

Strategic spatial planning tasks
Climate change directly affects flood protection, the living environment, biodiversity and the economy. To date, the consequences of climate change have only been taken into account in water management policy. This means that for a wide range of issues the spatial planning tasks have not been clearly defined yet. However, the primary features of the key tasks are already known. We can distinguish between tasks that are designed to prevent social disruption and
tasks designed to limit undesirable consequences. The large- and small-scale tasks can be combined using a design-based approach.

**Measures designed to prevent social disruption**
- A sustainable coastal defence programme, based on the utilisation of the natural processes in the coastal system, whereby the criteria for achieving flood protection also permit combinations of urban functions, natural development and intensive forms of recreation;
- A robust river system, based on achieving adequate storage and discharge capacity that can cope with the consequences of greater river discharge volumes and the rising sea level, in combination with reducing the peak load on the regional water system, and where possible combined with recreation and natural development. Urbanisation along rivers must also take into account the long-term dynamics of the river system.
- Robust spatial planning for urban and rural areas, geared towards the minimisation of damage and the protection of essential functions. A combination of compartmentalisation, ‘safe havens’ and direct protective measures that protect major population centres ensure that mainports, transportation and energy networks remain operational under extreme conditions and facilitate the rapid provision of aid and rapid recovery.

**Measures designed to limit undesirable consequences**
- A sustainable (regional) water system, with sufficient capacity to prevent extreme flood situations and guarantee a permanently high quality (ecological) water quality, as well as sufficient options to deal with the eutrophication of and presence of blue algae in the drinking water supply and the recreational use of surface water.
- A robust Ecological Main Structure (EHS) with large areas and good connecting zones to facilitate the (desired) migration of species and to reduce vulnerability in extreme scenarios such as long-term drought. Space for (new) climate-proof ecosystems that can continue to function even as climatic conditions change.
- A climate-proof living environment in towns and cities, geared towards preventing flooding caused by extreme conditions such as prolonged periods of high temperatures (“heat wave stress”) and extreme rainfall. Green and blue structures in and around urban areas that provide cooling and protection, store surplus water, prevent the displacement of floodwaters and improve the ecological qualities of the urban areas.
- Climate-proof buildings and districts that can withstand high/higher temperatures and floods. Building regulations and other safety norms in flood-sensitive areas that take the consequences of potential floods into account. Buildings and districts that can resist inundation over longer periods, that offer protection, escape and evacuation routes, and that make rapid recovery possible.
- A climate-proof agricultural sector that is geared towards providing capacity for the optimisation of agricultural businesses and crop-growing that can also deal with extreme weather, crop pests and diseases, and salination.
Examples of considerations for climate-proof use of space

1) If water management policy is to be climate-proof, long-term research will be needed to provide information on the bottlenecks in relation to discharge volumes of the major rivers if the sea level rises anywhere from 1 metre to 5 metres. In the short term, a strategic decision will have to be made about the most desirable type of solution. Can we continue in the long term passing on discharge volumes to the downriver area? Will we have to accept regular controlled flooding? Or can we opt for an alternative solution with an increased discharge via the IJssel and the IJsselmeer? The consequences of this could be that large sections of the river area, the IJssel and the IJsselmeer would have to be kept free of urban development.

2) Future coastal expansion is an option that will definitely have to be investigated, given the expected rise in the sea level. This topic will be the subject of the new national long-term vision for the coast that covers the 2050-2100 period, known as Kustvisie 2050 (Vision of the Coast 2050). The key question is how the Netherlands can develop a coastal zone that in the long term (i.e. 2050-2100) is climate-proof, sustainably secure, economically attractive and ecologically valuable, and what policy tasks and opportunities arise from this in the short term. The aim is to finish drafting this vision for the coast by the end of 2008.

3) We must calculate the flood risk for each new urban development and assess whether the spatial planning investments are justified. Building in low-lying areas, in the immediate vicinity of primary dikes and dams, and in places where there is a risk of major long-term inundation imposes specific requirements on spatial planning, access, and the technical design of housing and facilities. Measures such as increasing the height of flood defences/embankments and compartmentalisation could be required here, for instance. In any case, all locations will have to have sufficient room to carry out long-term adaptations, for example, for the large-scale retention and storage of water. In the short-term, we need to investigate proposed developments at vulnerable locations and possible alternative sites for buildings.

4) Factors that must be given high priority when reorganising existing urban areas and/or developing new locations include the development/redevelopment of urban water systems and green facilities and the prevention of unnecessary asphalting. A mix of dilution and intensification facilitates achieving two objectives: more space for water and green areas and a higher inner-city capacity as an alternative to permitting construction at vulnerable places. An analysis and possible readjustment of the urbanisation tasks for existing urban areas is desirable in the short term.

5) All essential functions must be checked to see whether they are sufficiently protected against potential floods and extreme weather. A national safety strategy has been developed as part of the National Safety Programme. One of the three priority topics that will be addressed as part of the work programme for the 2007-2008 period is climate change. A spatial planning vision that focuses on the vulnerability of essential functions and the spatial planning options to reduce vulnerability would dovetail well with this.

6) When implementing the EHS, additional resources will be needed to achieve the robust links and to counteract the fragmentation of nature reserves. If the development of nature reserves is linked more explicitly to a water management policy that focuses on flooding, drought and water quality then attractive options will open up for the future. At the request of the Dutch Lower House of Parliament, the Minister of VROM will provide financial support for the related ‘Climate Buffers’ initiative launched by nature conservation organisations. As part of this work, the restoration of natural processes will create unique and attractive nature reserves, with options for recreation and adapted forms of farming and housing construction.
A timely, cohesive and design-oriented approach to the above-mentioned tasks will not only give us suitable solutions to potential threats, but will also offer market opportunities, as well as options for making clear improvements to the spatial planning quality of the Netherlands.

- A longer and warmer summer season will create opportunities in both the tourist/recreational and agricultural sectors. The provision of green-blue services can be economically attractive.
- The development of knowledge of and experiences with water-related innovation offers opportunities for exporting knowledge. Making the Netherlands more climate-proof will boost our reputation as an attractive business location.
- Enlarging nature reserves and improving (international) ecological links will also help to create added rural and recreational value.

**Important issues**

The strategic spatial planning tasks described above mean we have to make important decisions that are often intra-sectoral in nature. They force us to make objective assessments and to come up with unusual solutions, some of which are fundamental in nature and often hedged by uncertainties. However, we cannot delay decisions on these issues any longer. At the current time, we face the following major issues:

- What does climate-proof planning and building mean? Which risks are acceptable in terms of living, working and essential infrastructure? Do the housing construction plans for deep polders have to be reviewed? Do we have to accept more personal risk for developments in vulnerable areas or must the creation of (greater) differences in safety levels be prevented by means of norms and rules?
- How do we keep the Netherlands safe and secure? Do we initiate a large-scale compartmentalisation dike-building programme and do we design new roads and motorways to also function as a back-up dike or evacuation route? Or do we prefer sunken construction, in order to reduce noise nuisance and benefit the countryside?
- What official weight should we give to the KNMI climate scenarios and the 'more extreme threat' scenarios when it comes to planning procedures and statutory frameworks? Which decisions and responsibilities will remain decentralised and which must be tackled centrally?
- How much leeway is there in the preservation goals set for Natura 2000? Is this leeway sufficient to cope with the more dynamic approach required by climate change?
- Will we continue to use freshwater to counteract the salination of the low-lying areas of the Netherlands? Or will we allow the salination to happen and invest in new crops and natural species? And should we then use this freshwater for other areas and uses?
- How do we create a reserve for investments that we will not need to make for 20, 40 or even 100 years, for example, for a more extensive coastal defence programme or for the major rivers? These are issues that could cause major changes to policies if the urban pressure increases. Aren’t these the very areas where investments need to be made in order to enable adaptation at a later date? Or should we assign a temporary permitted use for these areas?
- How will we provide water and green spaces in urban areas when at the same time the need for the more intensified use of existing urban areas increases, in part with a view to restricting construction in vulnerable areas as far as possible?
- How can we arrange financing for investments where costs and benefits will be realised at very different times or where one party incurs the cost and another the benefit?
What action should we take?

Climate change is a complex and multifaceted issue. Spatial planning adaptation to a changing climate is the responsibility of a wide range of different people and institutions: governments, businesses, NGOs and citizens. We need to change our – individual and collective – behaviour. This requires a broadly based approach.

The authorities are concentrating on the following aspects:

- We will work with the business community, NGOs and the scientific community to raise the level of awareness in society and stimulate its willingness to take action. We invite everybody to make a contribution to this effort. We will encourage the amassing and sharing of knowledge and the exchange of good practical examples and inspirational ideas.

- We will test the climate-proof nature of spatial plans and if necessary adjust them or create new instruments. To do this, we will draw up a specific assessment framework. The new way of thinking and taking action requires adapted or possibly even different plans, legislation and regulation, and financial instruments. These are needed to facilitate the necessary spatial planning measures and the desired change in behaviour. In this context, there will also be a review of the role played by the now commonly used (social) cost-benefit analyses in the decision-making process.

- We will work together with the business community to promote innovation and knowledge development. We will be looking for new (technical) designs and smarter spatial planning that can be used all over the world and which therefore offers opportunities for exporting knowledge. We will also be on the lookout for innovation in policy and organisation. We will create space for new public-private partnerships, particularly to encourage the necessary area-oriented approach to, for example, achieve the optimum mix of adapted town and country planning and CO₂ reduction.

- We will work towards a more future-oriented government that collaborates on all levels, shoulders its responsibility for implementation, dares to achieve and has an eye for the consequences of spatial planning decisions in the long term too. In other words, we will practise what we preach.

Working out the details of a broadly-based communication strategy regarding the consequences of climate change and the options for adaptation, reviewing the range of instruments available (legislation and regulations, financing instruments) and readjusting large-scale investment projects and types of spatial planning development is to take place at a national level.

Promoting an integrated and area-oriented approach, readjusting investment projects and implementing projects that contribute to the climate-proof spatial planning of an area shall mainly take place at a regional level. The regional level is the perfect platform for linking up knowledge and experience and for bringing together parties that wish to take an innovative approach to specific projects.
First steps towards an agenda

In respect of a number of specific programmes, the Dutch government will take the initiative to work with other governments to carry out further research into the consequences of climate change and to work out ways of taking an innovative approach. These programmes will be worked out in more detail and incorporated into the first national adaptation agenda to be published in early 2008. The government will initiate the following programmes, in consultation with the authorities and stakeholders involved:

- In consultation with the parties involved, including the planning agencies, we will look at which large-scale projects, area developments and investment programmes need to be reviewed or require further adaptation in the light of the KNMI scenarios.
- We will draw up a list of the areas that in a ‘worst case climate scenario’ could be under serious threat before the end of this century or that could require large-scale water retention/storage measures and identify the large-scale investments planned in these areas and whether these should be adapted.
- Collaboration with the business community, NGOs and knowledge institutions will be further intensified via a cohesive knowledge programme. The aim of this programme is to close the gap between research and the practical application of innovative methods to make the Netherlands climate-proof. The basis for this has already been laid down in the joint report Kennis voor Klimaat (Know Your Climate). We will also look at ways of improving the practical options in particular.
- Structural visions, both national and regional, will be used to map out the vulnerability of the primary spatial planning structure and specific areas (such as Groot Mijdrecht, Zuidplaspolder, Almere and Eemshaven) and to formulate starting points for the development of climate-proof spatial planning.
- Legislation and regulations will be critically reviewed and adjusted where necessary.
- We will find creative and effective ways of broadening the range of financing options for strategic investments (such as a Revolving Fund) that help to make the Netherlands more climate-proof. The options for deploying financial and fiscal incentives in order to make the Netherlands more climate-proof will also be reviewed.
- Climate change will be monitored closely, allowing us to adjust policy in a timely way where necessary. The systematic monitoring and evaluation of implemented adaptation measures will be used to monitor progress and to learn from successes and mistakes.
- We will use a long-term communication strategy that will maximise links with existing projects such as Nederland leeft met water (The Netherlands lives with water) and that will focus on creating an ongoing dialogue and coordinated action with all stakeholders.
- A number of new large-scale area developments will be reviewed to see whether incorporating climate change as a design criterion early on in the planning process would create such innovative and practical designs that they become the new ‘icons’ of climate-proof Netherlands.

We present this strategy jointly as Dutch public authorities as a first step towards the creation of a climate-proof Netherlands. The ambitious plans that are formulated here show that we are willing to work hard to achieve our objectives. We invite the business community, NGOs and the scientific community to make an active contribution and to come forward with specific proposals to create a climate-proof Netherlands.