



NOW FOR THE FUTURE

NATIONAL
DELTA PROGRAMME
2024

2024 DELTA PROGRAMME

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You will see underlined words and phrases from time to time in the text.
In the online version of the 2024 Delta Programme, these are hyperlinks.
You can find the online version on <https://english.deltaprogramma.nl>.
Cover photo: Land use follows the water system on 't Medler estate (Gelderland), January 2023



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Ministry of Infrastructure
and Water Management

The President of the Houses of the States-General
P.O. Box 20018
2500 EA THE HAGUE

**Ministry of Infrastructure
and Water Management**
Rijnstraat 8
2515 XP The Hague
P.O. Box 20901
2500 EX The Hague

T 070-456 0000
F 070-456 1111

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Annexes
2

Date 19 September 2023
Subject Cabinet response to 2024 Delta Programme

Dear President,

It is my pleasure to present to you the 2024 Delta Programme (DP2024). This is the annual proposal from the Delta Commissioner concerning the fields of flood risk management, freshwater supplies and spatial adaptation which is presented to you in accordance with Article 4.10(1) of the Water Act. The DP2024 reports on the progress and changes in the Delta Programme and on the measures for the years ahead. It was written in close collaboration between the national government, municipal and provincial authorities, water authorities, stakeholder organisations and the business community, and it enjoys broad support from all stakeholders.

Like last year, the Delta Commissioner presented DP2024 to the Cabinet with a sense of urgency. He referred to the IPCC synthesis report, which makes it clear that climate change is *the* challenge facing this and future generations.¹ The climate is changing faster than we thought, and so climate scientists are telling us that there is less and less time to secure a liveable and sustainable future for all. The Delta Commissioner therefore concludes that we need to speed up how we work together nationally in the Delta Programme and the implementation of concrete measures: we must also present clearer choices with respect to the limits of the water and soil system as a foundation for the spatial planning of our country. The Cabinet therefore supports the Delta Commissioner's appeal to the Provincial Councils and the executive boards of water authorities not to wait for the final legal anchoring of the principle 'water and soil as leading factors'. Indeed, it is now that it is important to press ahead and link water agendas to other transitions and ambitions in rural areas and the urbanised built-up environment.

In his cover letter accompanying DP2024, the Delta Commissioner sets out five recommendations and the related advice:

¹ www.ipcc.ch/assessment-report/ar6

1. *Apply generation tests in decisions about the spatial planning of the Netherlands*, offering to embrace and elaborate this idea in detail with young people and the partners of the Delta Programme.
2. *Involve citizens directly in work on climate adaptation*, recommending the acquisition of practical experience with new forms of participation in the years ahead. For example, by establishing a citizens' assembly for specific projects or programmes for large-scale, climate-resilient measures.
3. *Make clearer choices in the short term*. Here, the Delta Commissioner calls for an explicit focus on the enduring availability of groundwater, the transnational nature of agendas for groundwater and surface water, and enough space for the retention and storage of much larger amounts of water.
4. *Continue to build bridges and anchor them in Delta Decisions and strategies*, advising the further strengthening of the connection between Delta Programme agendas and other social agendas, and their inclusion in the preferred strategies that will be evaluated in 2026.
5. *Implementation in the regions should be central; frameworks, instruments and collaboration at the national level must be at the service of this objective*, with the accompanying advice being:
 - work on the basis of the spirit of water and soil as leading factors before planning decisions have been put into place (in law or otherwise);
 - take anticipatory action wherever possible;
 - develop structural financing from the Delta Fund, including financing for heat.

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Cabinet Response to the DP2024

In this letter, the Cabinet wishes to inform the House of Representatives about which steps are being taken to be better prepared for the consequences of climate change, and how the Delta Commissioner's recommendations are included in that process:

1. *Conducting generation tests for decisions about spatial planning in the Netherlands.*

The Delta Commissioner is right to emphasise that our decisions now will continue to have an impact for decades. That is one of the main reasons the Cabinet is committing to water and soil as leading factors in decisions in the physical living environment. It is necessary to consider now the boundary conditions that will have an increasing impact in the future. The Cabinet therefore supports the proposal of the Delta Commissioner to work with young people and partners of the Delta Programme to elaborate the idea of a generation test. The Cabinet's commitment here is to seek an approach that will take the long-term impact of our decisions into consideration even better. We would like to see young people actually involved in the early stages of this process and for them to be given the opportunity to be involved with discussions about, and contribute to, solutions. The Young Water Vision of the Young Climate Movement also serves as inspiration in this regard.

2. *Involve citizens directly in work on climate adaptation.*

In his recommendations, the Delta Commissioner states that new design guidelines, as described in the Parliamentary Letter on Water and Soil as Leading Factors, call for a different perspective on how decisions are taken. Adequate supplies of clean water and healthy soil are, after all, important for everyone. Achieving these goals requires measures and collaboration with numerous bodies such as water authorities, and provincial and municipal authorities. Local residents can also make crucial contributions.

That is because they see both the effects of climate change and the consequences of any measures needed to cope with that climate change. Both can have a major impact on the physical and mental health of local residents, for example during extreme heat waves, floods and outbreaks of infectious diseases, and also because of feelings of disempowerment with respect to major planning decisions in their immediate environment. The Cabinet embraces the Delta Commissioner's advice and it will be involving residents better in the time ahead and giving them more opportunities to participate.

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The Cabinet also recognises that change is only possible if there is awareness. The recommendations of the Pluvial and River Flooding Policy Platform show that local residents are not yet well informed about what can happen and what they themselves can do to prevent problems with excess water and high water. The Policy Platform has therefore added water awareness as an additional layer to the principle of multi-layer safety (prevention, consequence mitigation, crisis management and recovery). By focusing on what people can do themselves – the action perspective – an abstract concept like climate adaptation can be transformed into something that motivates people and gets them to act. For example by making their own gardens greener.

One of the recommendations of the Policy Platform's final advisory report has now been worked out in detail. This is the toolkit 'Basic communications about problems with excess water, flooding, heat and drought' that was developed for municipal authorities. It includes template texts about various aspects of climate adaptation for their own websites and social media, campaigns to join *and* tips for organising action of their own. In addition, sharing knowledge about historical developments in an area can help to raise awareness among local residents about the need for climate adaptation measures in their immediate environment. Moreover, measures can be designed to achieve not only adaptation objectives, but also other goals. An example would be a natural water storage facility that can also be used for leisure purposes. Local residents can be involved in discussions about measures like this. It is also important, when measures of this kind are taken, to avoid new risks (including health risks) such as the creation of breeding grounds for diseases (or disease vectors).

The Cabinet also sees that the water agendas in the areas of fresh water, flood risk management and spatial adaptation open up opportunities that lend themselves to innovative approaches to citizen participation. For example, since 2022 in the IJsselmeer area, the Water Challenges platform³ has been challenging teams of participants from different backgrounds to come up with innovative and creative solutions to water issues. Once again this year, some 35, mostly young, people are participating in the IJsselmeer Area Water Challenges. Citizen participation need not therefore be limited to a citizens' assembly. In the years to come, then, the Cabinet looks forward to exploring, with the Delta Commissioner, which (new) forms of participation are appropriate for increasing the involvement of local residents in these issues in concrete ways. This will also include looking at where concrete practical

² <https://klimaatadaptatienederland.nl/kennisdossiers/inwoners-stimuleren/toolkit>

³ <http://waterchallenges.nl>

experience can be acquired and the potential roles for the Ministries of Infrastructure and Water Management, Agriculture, Nature and Food Quality, and the Interior and Kingdom Relations.

3. *Make clearer choices in the short term.*

With the Delta Commissioner, the Cabinet believes that genuine decisions are needed to keep the Netherlands climate-resilient in both the short and long term. These are often difficult decisions, where it is important to take the limits of the water and soil system into account. The impact of climate change, as described by the Delta Commissioner, is therefore at the heart of the challenge on which the Parliamentary Letter on Water and Soil as Leading Factors is based. In turn, this letter constitutes one of the frameworks for the National Programme for Rural Areas (NPLG), the Spatial Policy Document and the periodical evaluation of the Delta Decisions and preferred strategies in 2026 (DP2027).

The Cabinet is aware that established policy frameworks do not yet guarantee that climate adaptation challenges will actually be addressed. The implementation strategy and agenda have therefore been drawn up in collaboration with the Association of Provincial Authorities, the Dutch Association of Regional Water Authorities and the Association of Netherlands Municipalities. The Delta Commissioner's appeal, therefore, is seen by the Cabinet as a welcome suggestion to work together on implementation, including two shared priorities.

Firstly to make clear decisions in concrete projects in order to transform intentions into workable daily practice. Retaining and storing water as much as possible, for example, are crucial to replenish groundwater supplies, but not enough. Clear decisions are also needed about reducing water demand and adapting spatial planning and land use in line with water availability. We must ensure that the optimisation of current land use does not lock in areas where this land use is not tenable over time. Instead, these measures should contribute to the transition of rural areas. It is only in this way that we can restore a healthy and balanced water system.

Secondly to ensure that the principle of Water and Soil as Leading Factors has a genuine impact on the Provincial Programmes for Rural Areas (PPLGs) in terms of the implementation of the NPLG, the Spatial Policy Document and the periodical evaluation of the Delta Decisions.

The Cabinet acknowledges the Delta Commissioner's observation that groundwater management is reaching its limits. In the Parliamentary Letters of 25 November 2022 on Water and Soil as Leading Factors⁴ and the NPLG⁵ for groundwater, the Cabinet therefore also provided frameworks to be included in the PPLGs. These include, for example, a monitoring and registration obligation, a groundwater ceiling and a priority sequence for extraction. In this way, the Cabinet is also implementing one part of the recommendation of the Groundwater Study Group, viz. to take steps in the short-term for the sustainable preservation of groundwater stocks. The Cabinet is also exploring the option of establishing a national reporting requirement for all extraction activities, and possibly even a permit requirement at the regional level. The possibilities and effects, for example in terms of the administrative burden, will be examined.

4 Parliamentary Papers 27 625 en 30 015 no. 592;

5 Parliamentary Papers 34 682 en 35 334 no. 105;

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The House will be informed about this area before the Water Legislative Consultations (WGO Water) in November 2023.

Furthermore, the Cabinet acknowledges the Delta Commissioner's observation that the 'anticipating the disaster' strategy is inadequate for the low-lying peatland and sandy areas. In this respect, the Delta Commissioner states that the periodical evaluation of the current Delta Decisions and preferred strategies in 2026 should therefore also look at fundamentally different policy options. The low-lying peatland and sandy areas also receive extra attention in the Parliamentary Letter on Water and Soil as Leading Factors. The planned approach to the low-lying peatland areas, for example, marks a certain break with how the Cabinet has provided direction based on land subsidence. More explicitly than previously, it sets out which frameworks based on the water and soil system are important and also the consequences for the use of land.

In the meantime, the Cabinet is already taking concrete steps on the road to specific decisions in the short term, for example with the national yardstick for a green climate-adaptive built environment⁶ and the recently published spatial assessment framework for a climate-adaptive built environment.⁷ Where the national yardstick sets out the options for climate-resilient design and construction, the spatial assessment framework answers the question of where it is best to build given the site-specific risks linked to the water and soil system.

The Cabinet endorses the importance of international cooperation on the river system and in the regional, transnational waters to which the Delta Commissioner refers. It also recognises the future importance given climate change. On the Rhine, Meuse, Scheldt and Ems, the Netherlands already has long-standing alliances with our neighbouring countries in international river commissions.⁸ For example, a proactive initiative from the Netherlands led to the inclusion of low water in the Rhine working programme. In addition, work is taking place on discharge scenarios in relation to climate change and water demands.

In addition to its involvement in these international river commissions, the Netherlands also works bilaterally on water agendas in transnational regional waters such as brooks and tributaries. In that context, discussions are now taking place with our neighbouring countries to establish supra-regional, transnational stress tests for these waters. The aim is to conduct joint studies to see where there will be bottlenecks in the event of extreme rainfall. Furthermore, the Cabinet is considering what more needs to be done on the basis of the agendas in addition to the ongoing activities. That will involve looking at whether a proactive contribution from the Netherlands can accelerate this process. In the case of the Rhine and Meuse rivers, this will involve reconnaissance studies devoted to this area, some of which are organised by the Integrated River Management (IRM) programme.

⁶ Parliamentary Papers 32 813 en 32 847 no. 1195;

⁷ Parliamentary Papers 27 625 en 30 015 no. 658.

⁸ This involves the International Commission for the Protection of the Rhine; International Meuse Commission; International Scheldt Commission and the Ems International Coordination Platform.

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4. *Continue to build bridges and anchor them in Delta Decisions and strategies.*

The Delta Commissioner states that the demarcated mandate for the Delta Programme – flood risk management, fresh water and spatial adaptation – is actually at odds with an integrated systemic approach in the sense that the artificial delimitation of the programme allows for little coordination between the water system and land use, and their associated functions. For example, between water quality and nature restoration, or drinking water and the selection of locations for housing construction. In this respect, the effects of climate change are not limited to water management. The government therefore endorses the importance of monitoring the coordination of the multiple agendas (including in local projects) and is actively looking at how the various agendas can be connected even better, as is seen in the Integrated River Management (IRM) programme. Another example where the Cabinet itself includes the ‘water interest’, including the principle of water and soil as leading factors, in the integral consideration of spatial interests for the future spatial planning of the Netherlands is the Spatial Policy Document. Work is now taking place on a new Spatial Policy Document. It will outline the integrated future perspective, including concrete decisions, for spatial development for the Netherlands in 2030 and 2050, and look ahead to 2100. We make these decisions on the basis of an integral approach to the physical environment. Water and soil are leading in that respect. The Delta Programme is therefore part of the basis for the National Spatial Policy Document. The first step on the road to the Spatial Policy Document is an outline paper, which will be shared with your House in the near future.

The Cabinet would like to draw the attention of the Delta Commissioner to an important area requiring attention: changes in structures or alliances should not lead to delays in the implementation of agendas. For example, the Cabinet attaches great importance to the rapid implementation of the agendas pursuant to the Water Framework Directive (WFD). A WFD stimulus programme has also been launched for this purpose. The Cabinet itself is taking the lead here, making use of the allocation of roles and administrative orchestration structures in place (such as the regional administrative consultation platforms and the WFD administrative consultations).

This does not detract from the fact that the Cabinet is eager to work with the Delta Commissioner to look at how steps can be taken to integrate planning even further. Building bridges between solution strategies while maintaining focus on implementing urgent projects: this is the core task for the Delta Programme.

5. *Implementation in the regions should be central; frameworks, instruments and collaboration at the national level must be at the service of this objective.*

The Cabinet wholeheartedly endorses the Delta Commissioner’s call to start working now in line with the spirit of water and soil as leading factors before planning decisions have been put into place (in statutory ways or otherwise). In the meantime, a lot of hard work is going into putting these decisions into place. This process will take shape in, for example, a joint implementation strategy with provinces, municipalities, water authorities and Rijkswaterstaat that will be sent to the House later this year.

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The Delta Commissioner urgently recommends the development of structural funding from the Delta Fund, including heat. First of all, the Cabinet expects that the Delta Programme on Spatial Adaptation will devote enough attention to the elaboration of water and soil as leading factors with the aim of making climate adaptation part of the intended integrated approach to the physical living environment. The financing of measures specifically targeting heat stress cannot be legally funded from the Delta Fund in the context of the current frameworks (cf. the scope of the Water Act). The question of whether changes to the legal framework are desirable can be included in 2024 in the evaluation of the Temporary Stimulus Scheme for Climate Adaptation 2021-2027 and, in addition, in the periodical evaluation of the Delta Decisions, preferred strategies and cost estimates for the Delta Programme in 2026. However, the government does believe that there are openings for linking agendas at local levels of government and therefore establishing broad-based financing for integrated area development. It is already possible to tackle heat stress through the Temporary Climate Adaptation Stimulus Scheme if the measures in question can be linked to measures to address water shortages and/or problems with excess water. This does not alter the fact that the Cabinet is happy to engage in discussions about the implementation problems identified by the Delta Commissioner and to explore possible solutions.

In conclusion

In these closing remarks, I would like to comment on the announcement by the Delta Commissioner, Mr. Glas, that he is resigning effective 1 December 2023 after a period of almost five years. The Cabinet is grateful to him for how, as Delta Commissioner, he has monitored and drawn attention in those years to the need for climate-resilient construction in the Netherlands. As the Delta Commissioner, he has played an important role in both the implementation and monitoring of the progress and continuity of the Delta Programme. The importance of this programme and the urgency of the agendas have also been seen this year, with the effects of the changing climate being manifested as a wet spring followed by a period of exceptional drought. It is up to all of us to push ahead collectively on our water agendas now.

Yours sincerely,

THE MINISTER OF INFRASTRUCTURE AND WATER MANAGEMENT,

Mark Harbers

**Ministry of Infrastructure
and Water Management**

Date

19 September 2023

Our reference

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M. Harbers
Minister of Infrastructure and Water Management
P.O. Box 20901
2500 EX The Hague

Delta Commissioner
P.O. Box 90653
2509 LR The Hague
www.deltacommissaris.nl

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Annexes
2

Datum 19 September 2023
Betreft Presentation of 2024 Delta Programme, Now for Later

Your Excellency,

It is again with a sense of pride, but also of urgency, that I present the 2024 Delta Programme.

The goal of the Delta Programme is a safe and liveable delta, now, in 2050 and far beyond. The climate is changing faster than we thought, and so there is less and less time to secure a liveable and sustainable future for all. This makes climate change the challenge for this generation and those to follow.¹ I have been honoured to serve as Delta Commissioner since 2019. During that time, it has become clear that taking no action is not an option. Four hot and dry years, the depletion of groundwater stocks, salt stress in the IJsselmeer, low water levels in the major rivers with problems for shipping, irrigation bans for agriculture and irreparable damage in natural areas are the consequences of water shortages that risk becoming structural unless far-reaching measures are taken. At the same time, we are seeing intense cluster showers in different places in our country, with damage to agriculture and the built environment as a result. The 2021 rainfall in the Eifel, Ardennes and Limburg led to flooding that was unprecedented in our region in recent years, with more than 200 lives lost in neighbouring countries and an estimated € 383 million in damage in Limburg and parts of Noord-Brabant.²

The second Delta Commission concluded back in 2008 that we are living in a vulnerable delta. We have very safe dikes, dunes and delta works. However, behind the dikes and in the higher parts of our country, the effects of extreme weather are becoming ever more apparent. Despite these worrisome developments, I am convinced that the sense of urgency and the will to act are increasing rapidly. In the political world and administrative circles, in the business sector and among citizens. We must realise that the Netherlands is a single, large, engineered water and soil system. Getting that system into order and keeping it in balance

¹ www.ipcc.ch/assessment-report/ar6

² Parliamentary Paper 32698 no. 75

with natural processes and the needs of society of the future will suffer no delay – there is no time to lose. This will also be a question of perseverance. Not just for years, but for decades and centuries. In addition to the annual publication of the national Delta Programme, I have published several solicited and unsolicited advisory reports in recent years. They included the report in 2021 in response to the question of whether the standards for the primary flood defences in the Meuse Valley in Limburg could be relaxed.³ Flood risk management in the Meuse Valley is, fortunately, now continuing with the standards set by law in 2017 for the entire country. Other examples include recommendations about housing construction and the need to take the effects of climate change into consideration more when building new homes.⁴ And an advisory report to the cabinet that took office in 2022 about the need to commit to climate adaptation and to earmark space now for flood risk management in the future.⁵ I am pleased to note that these recommendations have been heard, resulting not only in changes to policy but also, increasingly, in a focus on implementation. It should be pointed out that this is the crux of the matter. Because water itself is not greatly affected by policy. It is affected by conscientious action and the implementation of measures. After the March 2023 elections for the Provincial Councils and Water Authorities, I again made an appeal to the effect that: every new development has to be climate-proof.⁶ Measures must be designed to cope with the climate of the present and the future. Because doing nothing or doing too little now will result in ever greater risks of social disruption, and economic and ecological damage. Do not wait for the final legal anchoring of the Water and Soil as Leading Factors principle; move ahead now and link the water agendas to other transitions and ambitions in the rural areas and the urbanised environment.

The Netherlands is facing major spatial challenges and transitions in agriculture, nature restoration, housing construction and energy supplies. At the same time, we are running up against the limits of the water and soil system and technical solutions in different places. These transitions must be future-resilient and appropriate for the long-term climate challenges. The Delta Programme helps here and, on the basis of its focus on the long term, is contributing to the future-resilience of these transitions between now and 2050, 2100 and beyond.

Flood risk management is part of the Dutch character. But the task we now face is perhaps the most daunting in the long history of our beautiful country. My conclusion is that we not only need to speed up how we work together nationally in the Delta Programme and the implementation of concrete measures: we must also present clearer choices with respect to the limits of the water and soil system as a foundation for the spatial planning of our country.

Delta Commissioner

Date
19 September 2023

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³ Advisory Report from the Delta Commissioner 'Perspective for Limburg', 9 June 2021

⁴ [Advisory letter from the Delta Commissioner on Housing Construction and Climate Adaptation](#), 1 September 2021 and [Advisory letter from the Delta Commissioner on Housing Construction and Climate Adaptation \(Track 2\)](#), 3 December 2021

⁵ [Advisory letter from the Delta Commissioner Make work of climate adaptation](#), 6 April 2022

⁶ [Letter from Delta Commissioner on contribution of Delta Programme to spatial agendas](#), May 2023

Given this urgency, which I have also described in my previous advisory reports, and the progress you can read about in this Delta Programme, I wish to submit the following additional recommendations:

Delta Commissioner

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1. Conducting generation tests for decisions about spatial planning in the Netherlands.

The partners in the Delta Programme believe that it is their core responsibility, as a contract with society, to ensure that future generations can continue to live in a safe and liveable delta.

Young people have advised me to use generation testing,⁷ which is a powerful tool for raising awareness about not passing on consequences to future generations. They also advise broadening the assessment by involving more stakeholders so that they do not end up living ‘in the old generation’s view of the future’. Generation testing systematically assesses the impact of policies on future generations (until 2100). My proposal is to work with young people and the Delta Programme partners to embrace the idea of generation testing and work out the details. During that process, we look at the consequences of policy and implementation for ‘the new generation’s view of the future’. My commitment is to apply the developed test in any case during the periodical evaluation of the Delta Decisions and preferred strategies in 2026 (which will be included in the 2027 Delta Programme). Because the investments we make now, the measures we implement now, are not just for ourselves. They are for later and for those who come after us. That awareness and the responsibility to take them into account in today’s decisions should resonate more strongly in political decision-making.

2. Involve citizens

Citizens have a direct interest in the approach to climate adaptation. The Delta Programme Signal Group refers to social resilience in its advisory report: citizens must be involved better in the dialogue about climate adaptation measures and they should also be offered concrete action perspectives.⁸ To encourage involvement, the Physical Environment Consultative Body (OFL) has advised not only emphasising urgency, but also offering appealing perspectives. My recommendation for all stakeholders is to acquire practical experience in the years ahead with extending participation to include new forms in line with those pursuant to the Environment Act⁹ and including, for example, the establishment of a citizens’ assembly. For example in projects for dike upgrades and dike relocation, the large-scale retention and storage of water, and green and climate-resilient design in inner-city restructuring or new construction sites. In the Delta Programme, we will work with the regional sub-programmes to identify openings and opportunities for participation in addition to the usual ways of shaping participation and the participation framework of the Environment Act. In the case of the Delta Programme, this will mainly have an effect on strategy development for the long term. We are also looking at strengthening the risk dialogue in response to municipal stress tests. The risk dialogue is one of the seven steps in the approach of the Delta Programme for Spatial Adaptation.

⁷ See the letter from young people in [background document B](#).

⁸ See [background document A](#).

⁹ The Environment Act will take effect on 1-1-2024.

Stakeholders and citizens are consulted in the risk dialogues to determine, in collaboration with the authorities, which vulnerable locations identified by the stress tests can be tackled or not.

With the citizens involved, we will not only strengthen the support for decisions, we will also bring on board a wealth of local experience and brainpower. The application of new design principles such as Water and Soil as Leading Factors also requires a new way of looking at the governance aspects involved in making decisions. And we must have the courage to practise in this area. This could involve linking up with the outcomes of the Pluvial and River Flooding Policy Platform¹⁰, including the recommendations to establish supra-regional stress tests and to add awareness to the principle of multi-layer safety. With the aim of ensuring that everyone is water-aware and self-reliant, for example when there is extreme rainfall.

3. Clearer choices in the short term

Being prepared means that the partners of the Delta Programme need to explore and prepare the system choices now that will be necessary for climate resilience in the long term. This also requires short-term choices in order, for example, not to block solutions in the future or make them more difficult. The aim of the Delta Programme has always been to 'anticipate disasters' by implementing phased measures in such a way that we keep ahead of the consequences of climate change. In several areas, such as peatland areas and areas with sandy soils, we are seeing that this strategy is not enough. The upcoming periodical evaluation of the current Delta Decisions and preferred strategies will therefore also look at fundamentally different policy options for all three Delta Programme themes: flood risk management, freshwater availability and spatial adaptation. The options are now being prepared, for example in the Sea Level Rise Knowledge Programme, the Integrated River Management Programme, the Freshwater Delta Programme and multiple research programmes with universities and knowledge institutes.

It is still too early to opt for very concrete solutions and take decisive action. That would mean closing off options for the future. In the case of sea level rise, for example, decisions will be made later. That does not mean that decisions are not needed now in order to prevent consequences being passed on to future generations. The Water and Soil as Leading Factor (WBS) letter has already set out a direction in this respect. For most themes, we can make clear choices now. We should not build agricultural dams in areas where current land use is not sustainable in the long term. It may also be necessary – in view of the need to keep water fresh in the IJsselmeer area and not making the challenge more difficult there – to decide not to admit new water consumers, or to take shipping measures in order to ensure that the risk of salinisation does not increase. Another decision is that we can no longer allow any building at all in the floodplains and lakes of the IJsselmeer area. In the case of new urban expansion in deep polders, a tough choice is the earmarking of ten percent of the available space for water collection and space for heat mitigation. At the regional level, the 'spatial puzzle' will be worked out in the near future. The transformation of the principles of Water and Soil as Leading Factors into tools for specific local decisions is very urgently needed if we are to establish a position for the long-term agendas in the

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¹⁰ Parliamentary Paper 32698 no. 74

consideration and prioritisation of these area processes in a sustainable, climate-robust way. The National Yardstick for a green, climate-adaptive built environment describes how climate-adaptive building will take shape in practice.¹¹ In addition, the Ministries of Infrastructure and Water Management (I&W) and of the Interior and Kingdom Relations (BZK) are working on a spatial assessment framework for the climate-adaptive built environment to answer the question of where best to build. Postponing the resolution of problems makes it very likely that possible solutions will be blocked and that costs in the future will be high. Inaction is no longer an option!

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Proposals for a number of potentially far-reaching decisions for the spatial planning of our country will be made in the 2027 Delta Programme. It is crucial here for us to pay close attention to the influence that the various policy themes have on each other. The decisions must be made in conjunction with each other and with other agendas. The riverbed erosion mentioned in the parliamentary letter on Water and Soil as Leading Factors¹² and the low-water discharge distribution across the Rhine distributaries affect, for example, the level of the IJsselmeer, drinking water extraction, riverbed morphology, fish migration, shipping and the prevention of land subsidence. There is also a clear link here to the Provincial Programmes for Rural Areas (PPLGs) and the follow-up to those programmes. Decisions in this respect will have to be made repeatedly over the next few years, and I foresee multiple opportunities for good synergy with the water agendas. With respect to working towards potentially far-reaching decisions, I call for particular attention to be paid to groundwater, international developments and making sure there is enough space for the retention and storage of much more water. Caring for the sustainable preservation and use of our water and soil system is a prerequisite for sustainable area development. The urgency of these water agendas now requires specific and joint management from partners based on long-term programming. Allow me to explain this in greater detail.

First: the current management approach is running up against the limits of what is possible for the protection of groundwater stocks, with serious consequences for nature, drinking water extraction and damage to foundations. The sustainable availability of groundwater is essential to safeguard living conditions for future generations. Groundwater is an essential component of the water and soil system as a source of drinking water, water for agriculture and nature, leisure, landscape, prosperity and well-being. It is unseen and unknown, and therefore unloved. Until things are too late. In the years ahead, the protection of groundwater resources must be safeguarded, aridification damage must be reversed and further aridification must be prevented. That starts with retaining as much local water as long as possible. The Delta Programme is already investing heavily in the technical optimisation of water retention solutions in areas with sandy soils. But optimisation alone will probably not be enough, and changes in current levels of demand for water and current land use will have to be discussed. It is no longer possible to use technology to solve everything; the search for alternatives with the wider involvement of social partners is now urgent!

¹¹ Parliamentary Paper 32813 no. 1195

¹² Parliamentary Papers 27625 and 30015 no. 592

This requires national and regional orchestration through the National Programme for Rural Areas (NPLG). I also refer you to the recommendation of the Council for the Living Environment and Infrastructure (RLI) in 'Good water well regulated' to break with the non-committal approach and to implement the instruments we have.¹³ This fits in with the recommendation of the Groundwater Study Group to register and regulate all extraction by capping extraction and by using regional priority sequences.¹⁴ Implementation will not be easy here, and it will be accompanied by questions about the administrative burden and the available capacity for assessment and enforcement. But without data, it will be very difficult to make informed decisions about how to share scarcity.

Secondly: a greater focus on the transnational nature of agendas relating to groundwater and surface water tasks is now more important than ever. As a result of more extreme weather and possible physical interventions and changes in the Rhine and Meuse catchments located outside our country, river levels are fluctuating more. That may also have a major impact on water/groundwater availability and inland shipping. The low-water discharge in the Rhine is expected to fall due to the decline in the amount of water from glaciers and snowmelt, and increasing water shortages, but also because of measures taken by neighbouring countries upstream in preparation for climate change or developments in those countries associated with higher demand for water such as the intensification of agriculture. Aridification is also a major factor in the failure to fulfil international nature objectives.

I believe there is an urgent need for more internationally shared knowledge about rivers, exchanges of information and data, new models and improvements in our capacity to predict river behaviour from source to estuary. Changes in land and water use, and climate adaptation measures introduced by countries in the catchments affect the international river system as a whole. That requires a transnational, integrated approach to the water system.

I advise the establishment of links between the reconnaissance studies that will be devoted to this area, in part from the Integral River Management programme, and the inclusion of this objective on the agendas of the international river commissions (Rhine, Meuse, Scheldt and Ems), to determine how much additional capacity is needed for this purpose and whether a proactive contribution from the Netherlands can accelerate this process. This should match the intensification of alliances with neighbouring countries targeting transboundary regional waters in line with the recommendations of the Pluvial and River Flooding Policy Platform.

And thirdly: the need to earmark space now for water retention and storage in areas where there will be pressure on options for water discharge in the future. This is a factor in, for example, Central Holland, which depends on the IJmuiden pumping and discharge complex for water discharge. The area is already highly vulnerable to problems with excess water, as was evident in 2020 when a pump in the pumping station failed. That vulnerability will increase as discharge capacity is compromised by sea level rise, and

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¹³ [Good water well regulated \(rli.nl\)](#)

¹⁴ Parliamentary Paper 27625 no. 594

as a result of extreme rainfall of the kind seen in July 2021. There are also spatial ambitions in the same area, including the construction of tens of thousands of homes. Problems with excess water here cannot be prevented with pumping capacity alone and adequate storage facilities are required. That factor has to be included now in the spatial puzzles being addressed by the NOVEX platforms.

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4. Continue to build bridges and anchor them in Delta Decisions and strategies

The Delta Programme is working on three objectives: flood risk management, freshwater availability and spatial adaptation. The obvious goal is to adapt our country to cope with the effects of climate change in time. Because of the interdependencies between the water system (and the associated functions) and land use, the boundaries surrounding the policy domains of water quality, drinking water, nature restoration and site selection for building are sometimes artificial. All these factors highlight the need to make our approach even broader. While the current preferred strategies and Delta Decisions are still strongly rooted in the water domain, my recommendation is to further strengthen the connections that have been established between the agendas of the Delta Programme and other agendas in society such as construction and the NPLG, and to include these agendas in the re-evaluated preferred strategies. The area agendas that are already in place can be deployed for this purpose. Water and soil offer opportunities but they also determine the boundary conditions for the use of space. In addition, it is clearly important to anchor the agendas of the Delta Programme and the principle of Water and Soil as Leading Factors in the National Spatial Policy Document, the national framework that sets out the integral choices for the physical living environment in the short term, and the positions indicating the road towards the long term.

It is the shared responsibility of all government authorities to shape this interaction, put it into practice and take action where necessary. Tailor-made approaches, with dedicated partners, are required for this purpose in each region. They should include private and civil-society stakeholders, such as resident collectives, nature and conservation groups, and farming and business representatives. The starter packages with spatial agendas and the NPLG formulate the ambition for the major social transitions and, in that way, set out the right direction. In this area, I call for the full consideration of the advisory reports referred to here that I have published as the Delta Commissioner. The Delta Programme is also building a bridge to implementation at the regional level by using design research, linking water objectives to nature and landscape conservation, and the proposal to draw on the Delta Programme's existing consultative structures and proven operational capacity.¹⁵

¹⁵ See Chapters 3 to 6 inclusive of the 2024 Delta Programme.

5. Implementation in the regions should be central

Frameworks, instruments and collaboration at the national level must be at the service of this objective. The government frameworks that have now been set out – Water and Soil as Leading Factors, the National Yardstick for a Green Climate-Adaptive Built Environment – and the spatial assessment framework for site selection that is currently being developed must be put into practice and made concrete as soon as possible. The same applies to Integrated River Management. That will make the consequences more clearly visible and bring an end to the non-committal approach. Administrative commitment and statutory legal anchoring will be helpful in this respect, both for government authorities and market parties.

My recommendation for municipalities and provinces is to start working now in the spirit of Water and Soil as Leading Factors before the planning decisions and guidelines have been anchored (in statutory terms or otherwise). In the regions, this approach is already being seen in practice, for example with the application of requirements from the yardstick and a climate basis for spatial developments in Zuid-Holland. Moreover, instruments often focus on new developments, even though the challenges in the existing built environment are at least as large. My emphatic recommendation is to take action in anticipation of developments wherever possible. It is the shared responsibility of all government authorities to take joint action to implement the steps needed to anticipate developments. The Delta Programme wants to help provinces and municipalities do so wherever possible! A lot is at stake. The Netherlands is a beautiful, but also vulnerable, country and it deserves strong action.

At the municipal level in particular, there is considerable administrative support for tackling heat stress, water shortages and problems with excess water by using the approach and network of the Delta Programme on Spatial Adaptation. At the local level, citizens are seeing weather extremes in their own areas and the measures taken by their local authority. This requires unremitting attention and ownership from the national government. Once again here, I urgently recommend the development of structural funding from the Delta Fund. That should also include heat, a domain that is not currently covered by the Delta Fund. This is needed to strengthen operational capacity at the local level. It must be clear here how the measures to be financed will contribute to the goal of the Delta Programme for Spatial Adaptation.

This is the second annual Delta Programme to be presented to you as the Minister of Infrastructure and Water Management. The strength of the collaboration of the partners in the Delta Programme, led by a Delta Commissioner, and the continuity it offers, have again proved their worth in the past year. It is in part thanks to this organisation, those partners and this institute that I am able to present this 2024 Delta Programme to you.

In addition to the complete 2024 Delta Programme, I am also sending you the brochure 'Delta Programme Outlines'. This brochure provides a concise overview of progress for the relevant authorities in The Hague and in the regions. As a basis for a healthy discussion. And as a starting point for thoughtful and thorough work on a safe and beautiful Netherlands. Considerable passion went into the drafting of this document. I hope it will generate that same level of passion.

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In conclusion

Since preparations were made for the 2024 Delta Programme, the Rutte government has resigned. The Netherlands will go to the polls on 22 November. The political landscape that will emerge after the elections, the membership of the parliament and the coalition that will emerge to tackle the challenges facing this country are all uncertain at present. But one thing is crystal-clear: good water management will always be existentially important for the Netherlands. And the water agendas are becoming increasingly urgent; some of them are already acute. I hope that this awareness will become increasingly widespread in society and in the political world, and that the Delta Programme, with its focus on the long term, can serve as the foundation for physical planning and sustainable water management in our country. We are, when all is said and done, working now for later.



mr. drs. Peter C.G. Glas
Government Commissioner for the National Delta Programme

Delta Commissioner**Date**
19 September 2023**Our reference**
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Delta Commissioner's recommendations

1 Generation test



Make clear the consequences of our spatial decisions for future generations. Develop a generation test in collaboration with young people. The Delta Programme will apply a generation test during the periodical evaluation of the Delta Decisions and preferred strategies in 2026.

2 Involve citizens



Enhance civic engagement and resilience: talk to citizens about climate adaptation and describe appealing prospects (for action). Seek new forms of participation such as a citizens' assembly. That includes strategy development for the long term.

3 Tough choices now



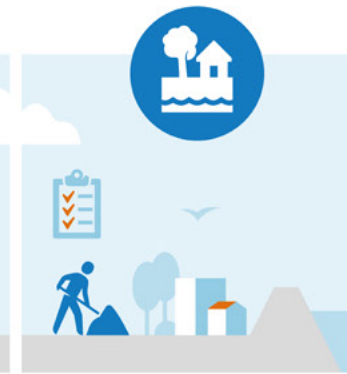
Keep pathways to a climate-resilient future open with clear decisions and conditions. For instance: earmark space for water retention during urban expansion, do not facilitate land uses that are not sustainable, be critical about new water consumers and so on.

4 Bridges between policy themes



In area processes, connect short- and long-term water agendas with other societal agendas. Give the Delta Programme the room to establish those connections itself. Use the consultation structure and operational capacity of the Delta Programme for this purpose.

5 Feasibility front and centre



The agendas for nature restoration, housing, water quality and climate adaptation meet in the regions. The national government must support implementation with concrete frameworks (legal and otherwise) for Water and Soil as Leading Factors and structural funding to tackle heat stress, water shortages and problems with excess water.



Chapter 1

Administrative introduction

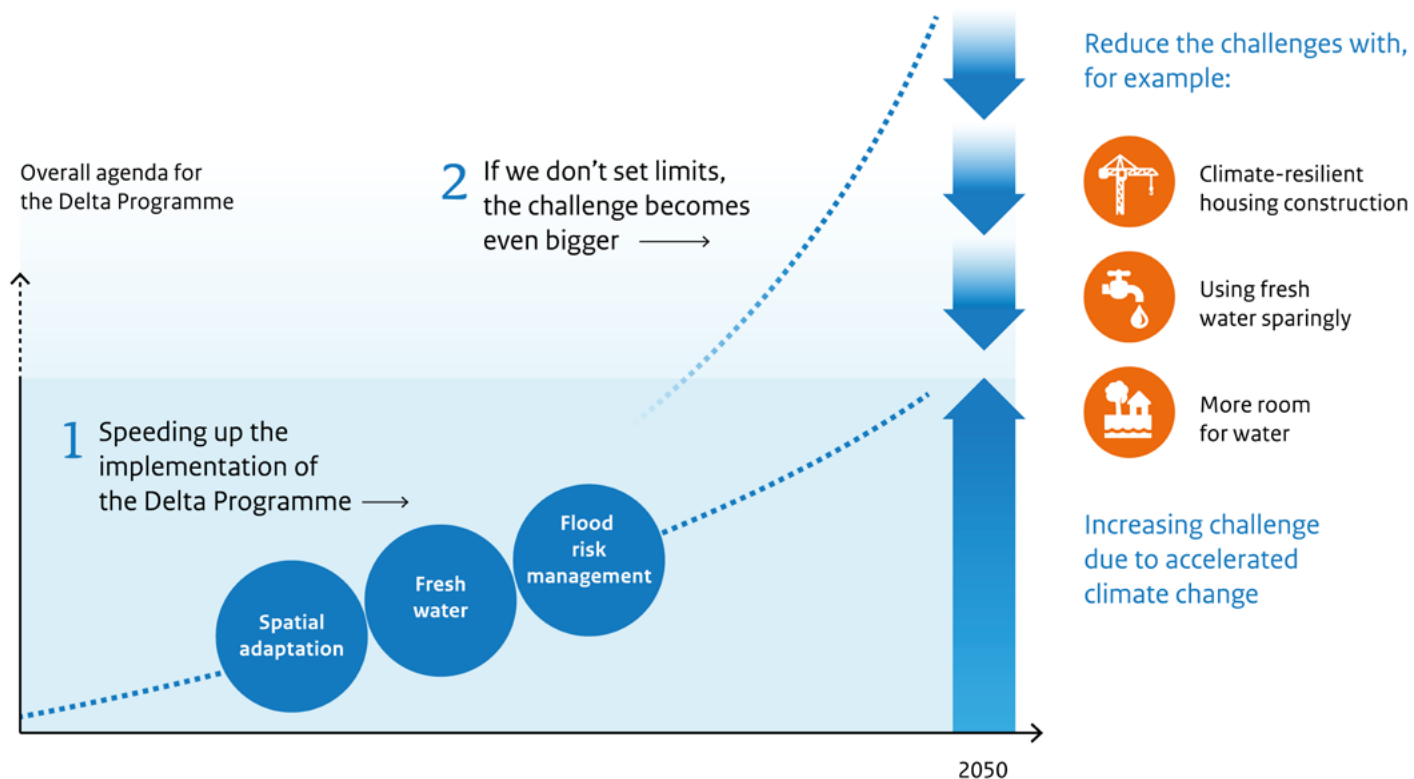




CORE MESSAGE

Speeding up work on a safe and liveable delta *and* setting limits

- 1 The National Delta Programme protects the Netherlands against flooding, ensures that there are adequate supplies of fresh water and contributes to climate-resilient and water robust spatial planning. We must move faster: climate change is continuing and the effects are already clear to see.
- 2 At the same time, it is becoming increasingly evident that not everything is possible if we want the Netherlands to stay climate-resilient: we also need to set limits on the use of space and water.





On 1 February 2023, the Netherlands remembered the victims of the disastrous floods of 1953. Seventy years after the event, the stories of the families and survivors are still heart-rending: disasters like this continue to have an impact on people's lives decades later. So there are enough reasons for us to agree that there should never be a repeat of 1953.

We want to prevent any recurrence and keep the Netherlands safe, beautiful and liveable by being better prepared for problems with excess water, water shortages and heat. We must move faster: climate change is continuing and the effects are already clear to see. At the same time, it is becoming increasingly evident that not everything is possible if we want to keep the Netherlands safe and make it climate-resilient: we also need to set limits on the use of space and water.

“

Everything we need to live a decent life is directly related to water. Our health, food, safety, habitat, economy, infrastructure and climate. Water security is one of the defining concerns of our time, and it will determine our collective sustainable future.

From H.M. King Willem-Alexander's speech at the opening of the UN Water Conference 2023 in New York

“

Water is a human right – and a common development denominator to shape a better future. But water is in deep trouble. We are draining humanity's lifeblood through vampiric overconsumption and unsustainable use, and evaporating it through global heating. We've broken the water cycle, destroyed ecosystems and contaminated groundwater.

From UN Secretary-General António Guterres' speech

1.1 Urgency and perspective

In its March 2023 report, the international IPCC climate panel made no bones about it¹: the steps the world has been taking so far to reduce greenhouse gas emissions are not nearly enough to tackle the climate crisis. It is already no longer possible to stop the global average temperature rising 1.5 degrees by 2050. If we continue down this road, children being born now will, by the end of their lives, face very severe consequences as a result of climate change.

Even so, there is perspective. The faster we reduce greenhouse gas emissions (mitigation), the more time there will be to keep the consequences of climate change manageable. And the sooner we adapt spatial planning to the new climate (adaptation), the less vulnerable we will be to damage.

1.2 Speeding up and making choices

So it is essential to speed up our response. The decisions we make this decade will have a major effect on the safety and living conditions of generations to come. The first milestone for the National Delta Programme is 2050: the Netherlands will have to be water-robust and climate-resilient by that time and be in a position to implement the adaptations needed after that. That is why, in the Delta Programme, we are also already looking at 2100 and beyond: the effects of climate change now will persist for centuries.

¹ [Intergovernmental Panel on Climate Change \(IPCC\), AR6 Synthesis Report: Climate Change 2023, March 2023](#)

Speeding up

Above all, we must speed up the implementation of the programmed measures in the three Delta Plans so that everyone living behind a primary flood defence will enjoy the basic level of protection by 2050 and so that our country will be resilient to water shortages and structured on climate-resistant and water-robust lines in 2050. The infographics at the beginning of the chapters show the direction this acceleration needs to take. Firstly, by addressing the effects of climate change that are already apparent, such as the recent problems that have already been causing extensive damage: extreme rainfall, water shortages due to lower river discharges, the decline in the quality of nature due to non-sustainable land use and problems with drinking water supplies. In addition, important decisions will be needed in the short term to prevent the stagnation of measures in order to tackle, for example, changes in the positioning of the beds, and the storage and discharge capacity, of the major rivers. It is important to do this with an integrated perspective, precisely with a view to the long term.

The combination of the agendas and measures of the Delta Programme with transitions in agriculture, housing, energy supplies and nature restoration also needs to be implemented quickly. This requires the further concretisation of how the water and soil system should lead spatial planning choices: the goals of the Delta Programme can only be achieved if the Water and Soil as Leading Factors principle truly constitutes the basis for action and permeates all the agendas in the spatial domain.

The call for speed also applies to the collaboration between all parties involved in the five steps in multi-layer safety to ensure that we, as a society, are prepared for the climate trends 'wetter, drier, hotter and more frequent'. The search for the appropriate instruments that the financial sector can use in the cause of climate adaptation is an example of the widening and acceleration of our response.

In the National Delta Programme, the national government, provincial, municipal and water authorities are working together under the direction of the Delta Commissioner on the major challenge of climate adaptation until 2050 and the longer term. The partners see work on the objectives for flood risk management, freshwater availability and spatial adaptation as a contract with society.

All the messages from the Delta Programme in recent years continue to be fully relevant: the urgency of climate adaptation, the need to ensure that every new development is climate-resilient, the realisation that the time for freedom of action is over. A lot is happening. Just a few examples: there are the components of the starter packages for the physical living environment such as the National Programme for Rural Areas, the NOVEX areas, Water and Soil as Leading Factors, and of course the implementation of the Delta Programme itself. Everyone concerned must continue this work vigorously, but it is not enough. The point is approaching when we will have to make tough choices to keep the Netherlands safe and liveable in the decades ahead; that conviction is shared by the partners of the Delta Programme. Some decisions already have to be made about water management and spatial planning to cope with increasingly extreme weather (too wet, too dry, too hot) and to fulfil the goals of the Delta Programme. Such as opting for climate-resilient building, measures to stop land subsidence, and measures (such as retaining water) to cope better with problems with excess water, heat and water shortages. See the

figure 'Speeding up work on a safe and liveable delta and setting limits'. We have more time to consider other decisions. Examples here include adapting to sea level rise and changes in river discharges, even though we should ensure that we leave enough room for those adaptations. Every new development has to be climate-resilient. The partners are calling on everyone involved not to wait until everything is absolutely clear (legally or otherwise), but to speed up now in sensible ways: to set priorities and to implement measures in such a way that adaptation options are kept open.²

The Delta Programme itself wants to speed up the implementation of its own objectives for flood risk management, freshwater availability and spatial adaptation. In 2022, the Delta Programme already reported that we need to move ahead faster, particularly in the areas of fresh water and spatial adaptation. This 2024 Delta Programme (DP2024) describes how that is being done. At the same time, the Delta Programme is committing to the acceleration of climate resilience and water robustness in other domains: in housing construction, agriculture and planning for rural areas. That requires courage from administrators and people working in the field in order to get to work energetically. The implementation of the Delta Programme demands a lot from the regions, and

² In line with the appeal from the Area Development Knowledge Foundation: www.gebiedontwikkeling.nu/artikelen/het-organiseren-van-uitvoeringskracht-in-onzekere-tijden



certainly in combination with the other major agendas. There is a widely felt need for more operational capacity at the regional level: more people with the right expertise to manage complex agendas, enough financing to cope with rising costs, and adequate tools to speed up the permit process and other procedures.

1.3 Setting Limits

For centuries, the Netherlands has used engineering to bend the water and soil system to its will. Initially, that was the intention when it came to the agendas of the Delta Programme and other major social agendas. In several areas, however, the limits of what can be achieved with technical solutions have been reached: if we carry on down this road, we will run into a dead end. This is already a factor in the high-lying areas of the country with sandy soils, where water shortages are causing major problems, and in the peatland areas, where salinisation can no longer be prevented in some places.

Our capacity to shape the Netherlands in climate-resilient ways and to adapt sustainably to more extreme climate events depends largely on the extent to which we respect the limits of our natural environment. That is why the Dutch government made policy decisions in November 2022 that allow water and soil to serve as the leading factors for spatial planning in the country.³ Water and Soil

³ Parliamentary Papers 27625 and 30015, no. 592

as Leading Factors is also the guiding principle for the new Spatial Policy Document.⁴

The goal is to make sure we do not exceed the limits of the water and soil system so that the use of space remains as sustainable as possible and so that we do not pass on problems to other areas or later generations, or from the private to the public sectors.

The policy decisions have a direct effect on the Delta Programme. Such as the decisions to stop building outside the dikes in the IJsselmeer area and along the rivers, to retain more water in areas of the country with sandy soils and to raise groundwater levels in peatland areas. Provincial, municipal and water authorities are already making the switch to Water and Soil as Leading Factors. Sometimes cautiously, but increasingly in energetic ways. Climate adaptation is on this agenda everywhere.

From the outset, the Delta Programme has been working in the spirit of Water and Soil as Leading Factors with respect to spatial planning choices. The letter from the Dutch Cabinet made this concrete on the basis of planning decisions.⁵ The partners in the Delta Programme applaud this development. It is a paradigm shift after decades of building and planning in which the physical condition of the delta was managed in increasingly artificial ways and in which future-resilience received little attention.

⁴ Parliamentary Paper 34682, no. 92

⁵ Water and Soil as Leading Factors letter, Parliamentary Papers 27625 and 30015, no. 592

The Delta Programme emphatically seeks to establish connections with transitions in society as a whole and ambitions outside the water domain in order to support shared goals and accelerate the impact of changes in underlying principles.

1.4 Connections

All the urgent agendas meet in the regions: housing construction, nitrogen deposition and nature, the energy transition and climate adaptation. These are all transitions that, for various reasons, must be completed rapidly and that will take up our space. Because everything is interrelated and space is limited, the solutions and space required should serve as many agendas as possible at the same time. And because not everything can be combined, choices also have to be made.

When connecting agendas – and not just in the water domain – the principle of Water and Soil as Leading Factors has proven to be a useful basis that can count on support. The role of the Delta Programme here is to sketch a picture of the long-term climate challenges, including those at the supra-regional level. The goals of the Delta Programme have been established; a dialogue between all the partners will determine how we achieve them together.

The solutions in the different regions are not separate from one another, particularly in the case of long-term interventions in the main water system. In much of the Netherlands, solutions for fresh water and flood risk

management, for example, depend very much on how high and low river discharges will develop. Integrated River Management, a programme under the Environment Act, will include the choices for the future discharge and storage capacity of the major rivers, low-water discharge distribution (including restoration), and urgent work on subsiding riverbeds. It is important to implement these decisions in conjunction with other agendas of the Delta Programme: the agendas for fresh water and the area agendas in the IJsselmeer area, Rhine Estuary-Drecht Towns, the Southwest Delta and the Wadden area, among others. Previous recommendations from the Delta Commissioner may play a role here, examples being the recommendations about linking water objectives to nature and landscape conservation, the exploitation of existing consultative structures and using design research to visualise and jointly interpret facts, ambitions and effects in map images.

Connecting with initiatives outside the Delta Programme

Parties are also working outside the Delta Programme on decisions that will have consequences for long-term spatial development. Where necessary, the Delta Programme also establishes connections in order to arrive at coordinated solutions for the challenges we face. The focus of the national government is on the connection with Water and Soil as Leading Factors and the National Programme for Rural Areas (NPLG) but also, for example, with the Mooi Nederland (Beautiful Netherlands) programme, the preparations for a new National Spatial Policy Document by the Minister of Housing and Spatial Planning and the Board of Government Advisors' 2100 Future Workshop.

The Delta Programme also works with knowledge institutes and other non-governmental parties, for example when research, initiatives or case studies may be significant for the Delta Programme as a whole or a specific region. The Delta Programme aims to make the most of new knowledge and insights quickly for the periodical evaluation of Delta Decisions and preferred strategies, where possible as early as the implementation phase.

1.5 Grip on volatility

Climate change leads to more volatile, unpredictable and extreme weather.⁶ In the summer of 2021, Limburg in the Netherlands was battered by extremely heavy rainfall that exceeded statistical expectations, with floods and extensive damage as a result. The Pluvial and River Flooding Policy Platform has found that this type of weather will become more frequent *and* that it could also affect other parts of the Netherlands, causing major social disruption and economic damage.⁷ Since 2018, we have had four dry years and the discharge level in the Rhine fell to record lows in 2022. Water shortages are already leading to structural damage to nature, restrictions on shipping, land subsidence and bottlenecks affecting drinking water sources (as a result of which drinking water companies cannot always fully meet drinking water demand from business customers).

⁶ KNMI Klimaatsignaal, 2021

⁷ Final Advisory Report from Pluvial and River Flooding Policy Platform. Parliamentary Paper 32698, no. 74

Speeding up also means getting better at working with uncertainty. The aim continues to be 'anticipating disasters' but we cannot prevent everything in this changing climate. We must continue to invest in reducing the probability and impact of flooding but we also have to prepare for situations in which things do go wrong. By working on crisis management and resilience. And by raising awareness in society as a whole that material damage cannot always be prevented and explaining what action is possible in those circumstances. The Pluvial and River Flooding Policy Platform has put forward sound proposals about how to go about this.

1.6 Periodical evaluation: modifications using the latest insights

Options for the future structure of the Netherlands must be brought into focus faster because climate change is accelerating, extremes are increasing and there are so many urgent challenges. The Delta Programme contributes here by conducting regular reviews of the options for a safe and climate-resilient delta in a structured way and on the basis of new knowledge and insights. The process for the second six-year evaluation began in 2023. That will result, in 2026, in proposals for the adaptation or amendment of Delta Decisions and regional preferred strategies.

The second periodical evaluation will be based in part on new climate scenarios from the KNMI (the Royal Netherlands Meteorological Institute) and new scenarios for Welfare and the Living Environment (WLO) from the



Netherlands Environmental Assessment Agency, both of which will be published in late 2023. The results of the Sea Level Rise Knowledge Programme are also important as a basis for the periodical evaluation. The initial results of the knowledge programme were published in June.⁸ They cover, in particular, the question of whether we can cope with the consequences if we continue with the current strategies for flood risk management and fresh water. In addition, the knowledge programme is working out the possibilities for three other long-term solution directions in area meetings: *Protect Open and Closed*, *Seaward and Flexibility*⁹.

In 2023, research consortiums are working out these directions in more concrete terms. The interim results of the Sea Rise Knowledge Programme will be available in November 2023; the final results will be published in 2026.

The periodical evaluation of the delta decisions and preferred strategies affects other agendas. For example, the periodical evaluation of low-water discharge distribution over the Rhine distributaries has consequences for the preferred strategies for the Rhine Estuary-Drecht Towns, the Southwest Delta and the IJsselmeer area, and the agendas for drinking water extraction, fish migration, shipping, raising water levels in peatland areas and slowing down riverbed erosion. Proposals must therefore be developed in conjunction with other areas and agendas.

⁸ Parliamentary Papers II 2022-2023, 32600-J no. 7

⁹ The reports of the area meetings can be found on the [Sea Level Rise Knowledge Programme's website](#)

It may no longer be enough in all cases to make current infrastructure and spatial planning climate-resilient and water-robust with an adaptive step-by-step approach. We must therefore also prepare for larger transformations. In the years ahead, the partners in the Delta Programme will be investigating the need for fundamental systemic changes in the longer term ('the Delta Works of 2100'). That will include things like fundamentally different interventions in coastal defences, the distribution of the low-water discharge from the major rivers and managing the level of the IJsselmeer buffer.

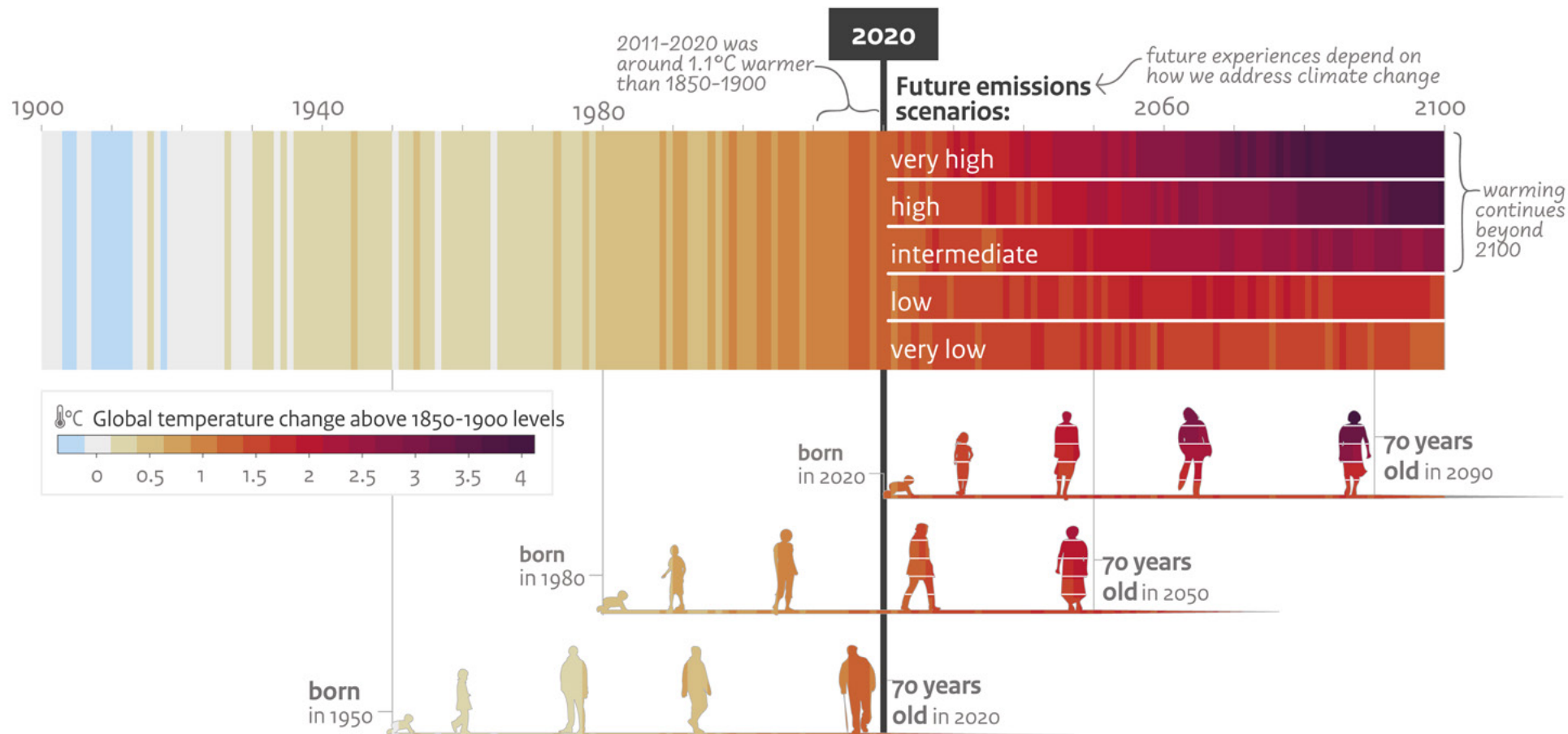
1.7 Working on a climate-resilient future

In the Delta Programme, the Netherlands has a globally unique alliance for keeping our country safe and climate-resilient but it is becoming increasingly clear that we need to extend the network to include actors outside the government. To speed up and maintain that momentum, the Delta Programme wants to follow more routes towards a climate-resilient future. The partners in the Delta Programme are committed to increasing the contribution of the financial sector, supporting collaboration at the European level and raising the level of social engagement and solidarity between generations. It is necessary to speed up in order to leave the Netherlands safe and liveable for future generations.



Figure 1 The extent to which current and future generations will live in a warmer and different world depends on choices made now and in the short term.

Source: IPCC, [AR6 Synthesis Report](#), Figure 'SPM.1'





1.8 Delta Fund and financing for the implementation of the Delta Programme

The Netherlands will have to be water-robust and climate-resilient by 2050 *and* be in a position to implement the adaptations needed after that. We need to speed up implementation and that means: making choices, setting limits, establishing connections, looking for new ways forward *and* putting into place the preconditions needed for implementation. Central *and* local operational capacity are essential. The basis here consists of adequate, integral and structural financing. The Delta Fund is the main source of funding at the national level. A range of sub-programmes in the Delta Programme are financed in this way, both on an incidental (impulse schemes) and structural basis. The costs of the agendas of the Delta Programme will rise in the years ahead as the agendas for a water-robust and climate-resilient country increase in size. To continue to speed up and maintain that momentum, it is therefore fundamental for funding for the various programmes to be available on a structural basis and for there to be sufficient resources.

The Delta Commissioner is of the opinion that, in principle, the rising budget gap in the medium term is still manageable but that, given the increasing size of the challenges involved, operational capacity is even more under threat. Increasingly, budgetary pressures and feasibility are concerns for the Delta Commissioner. If this budgetary pressure continues to increase in the years ahead *and/or* operational capacity in the market continues to be an obstacle, potentially drastic decisions may be needed with a

negative effect on the scope, the pace of implementation and priorities, and therefore the effectiveness, of the Delta Programme. The Delta Commissioner considers this to be undesirable. So in this context, too, the second periodical evaluation (DP2027) of the Delta Programme represents an important moment for an assessment. A more detailed analysis of the budgets accounted for in the Delta Fund budget can be found in Chapter 7.

1.9 In conclusion

In 2007, the question put to the Delta Commission by the Cabinet was: will our country continue to be an attractive place to live, work, spend leisure time and invest for a large number of future generations? The answer is still ‘yes, as long as’: as long as we speed up the mitigation of limiting climate change *and* approaches to cope with the consequences. We must adapt to a new climate, within the limits of the natural water and soil system. This requires the partners in the Delta Programme to maintain their vigorous pursuit of the objectives of the Delta Programme, to underpin difficult choices, to prepare clear decisions *and* to have the courage to say ‘that can’t be done here’ or ‘that can’t be done like this any more’. We owe that to the people living in the Netherlands, now and in the future.



Chapter 2

Developments in the National Delta Programme: more routes to a climate-resilient future



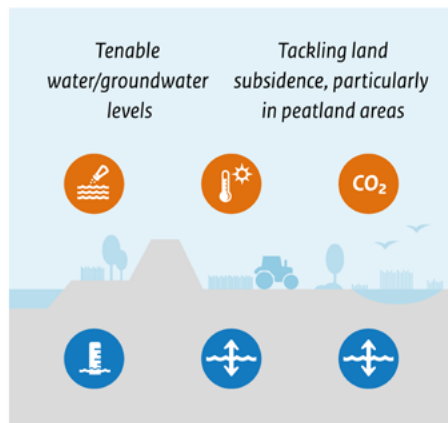


MORE ROUTES TO A CLIMATE-RESILIENT FUTURE

The Delta Programme must speed up. That requires broader commitment

Limits to water and soil

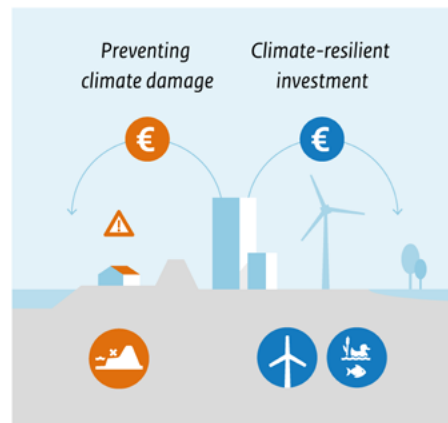
We are on the eve of major changes in land use. By choosing future-resilient solutions now, respecting the limits of water and soil, we prevent ...



... problems for future generations: social disruption caused by flooding, water shortages and land subsidence. For more grip on more erratic weather.

Financial sector

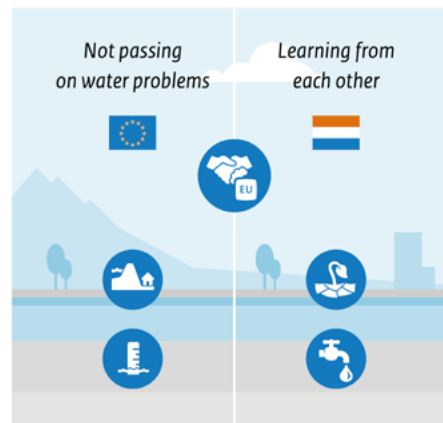
Banks, investors and insurers can provide incentives for climate-resilient investment. For example through premiums, conditions for financial products and policies.



This provides a big boost for 'every new development climate-proof'. The sector itself benefits as well: the risk of declining value due to climate damage is reduced.

International approach

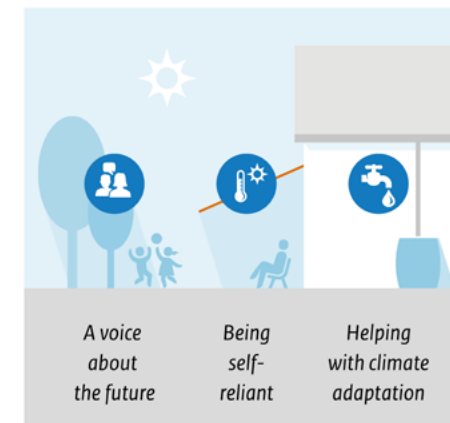
Rivers know no borders. How other countries cope with climate change may alter the challenges of high and low water in the Netherlands, for better or for worse.



The same applies to transboundary groundwater stocks. So a joint approach is needed. And countries can learn from each other.

Social engagement

How do we shape the Netherlands to cope with extreme weather? We need to involve citizens more in that decision. And particularly young people because it's their future.



In addition, it is important for people to know what they can do themselves during heat waves, droughts and floods.



2.1 Water and Soil as Leading Factors

The coalition agreement ‘Looking out for each other, looking ahead to the future’ (in Dutch: ‘Omzien naar elkaar, vooruitkijken naar de toekomst’) from 2022 adopted water and soil as the leading factors for spatial planning in the Netherlands. The concept is not new but the urgency has increased. This is because water management in different areas, such as peatlands and areas of the country with sandy soils, is reaching the limits of what can be done with technology. The Netherlands also has major spatial agendas that must be in line with the long-term sustainability of the water and soil system.¹⁰ The principles of Water and Soil as Leading Factors (WBS) will be adopted in the requirements and elaboration of the National Programme for Rural Areas (NPLG), housing plans and spatial arrangements to be adopted in the autumn of 2023. The NPLG focuses on the orchestrated implementation, led by the water and soil system, of agendas and obligations relating to nature, agriculture, water and climate.

WBS is also the basis for the new National Spatial Policy Document to be published in 2024. In the parliamentary letter National Direction in Spatial Planning, the government explains how it intends to provide direction

¹⁰ The Cabinet sent a letter to the House of Representatives in late November 2022 setting out the WBS principles and formulating them as 33 planning decisions and 55 measures. The central underlying principle is to avoid passing on problems to other areas, to future generations and from the private to public arenas. Other principles include taking extremes into account and safeguarding a coordinated approach to excess water, water quality and water shortages.

for the numerous large agendas in the physical domain. Through the NOVEX and Mooi Nederland (Beautiful Netherlands) programmes, the national government is resuming its directive role in the field of spatial planning. Mooi Nederland focuses on spatial quality; NOVEX addresses the operational side in collaboration with provincial and municipal authorities. NOVEX includes working towards administrative agreements (spatial arrangements) with the provincial authorities in 2023 about the spatial incorporation of agendas in the areas of housing, accessibility, energy, economy, agriculture and nature. The agreements constitute the basis for the new Spatial Policy Document that will be published in 2024.

The Delta Programme helps to put the WBS principle into practice with a national approach, a long-term focus, an integrated systemic approach, and effective governance and implementation. In addition, the WBS principle makes it clear that the current approaches to land use and water management can no longer be maintained everywhere. The water and soil system imposes clear limits on functions and the amount of space they use. Transitions and choices for society as a whole are inevitable. This affects people and businesses, and it is expected to be accompanied by considerable debate and even resistance. This requires a shift in our thinking and behaviour – that also includes the Delta Programme – and it may have consequences for the assessments made, the programming of implementation, and the collaboration and connections between water management and other spatial agendas such as the NPLG and the housing agenda. The Delta Programme provides a trusted governance platform,

both in the subprogrammes and at the Steering Committee level, for this coordination and for identifying and capitalising on synergy opportunities. Chapter 6 describes how the areas in the Delta Programme are already implementing the WBS principles. In addition, the Delta Programme is contributing actively to policy development. Examples are the National Yardstick for a Green Climate-Adaptive Built Environment and the spatial assessment framework for a Climate-Adaptive Built Environment. On the road to 2027, the Delta Programme is also working on the periodical evaluation of the Delta Decisions and preferred strategies. The people of our delta have had an adaptive approach to the natural landscape for centuries. This historical insight can also serve as a basis for the future when designing climate-resilient landscapes.

2.1.1 Grip on volatility: Delta Programme Signal Group

Climate change is increasingly clear to see: more volatile weather with cloudbursts, heat waves, drought, floods and accelerating sea level rise. Moreover, the consequences are more far-reaching than previously anticipated. Prolonged drought, for example, is leading to low water levels in our rivers. This interferes with shipping and reduces water supplies for agriculture, horticulture and industry. And that in turn leads to shortages of commodities elsewhere in the chain. New insights and concrete measures are needed to get to grips better with this complex system of volatility and uncertainty, and the associated domino or cascade effects. There is a risk here that the focus on emergencies and the

short term may divert attention away from the long-term implications of climate change.

Every year, the Delta Programme Signal Group advises the Delta Commissioner about relevant scientific and social insights, and trends that the Delta Programme should be focusing on.¹¹ In 2022, the Signal Group discussed the increasing levels of volatility in the confluence and knock-on effects of climate patterns. In order to prepare more for this and be able to estimate climate effects, work is taking place on stress tests for spatial adaptation and freshwater supplies. An important step in this area is collaboration and joint development with security regions and crisis management organisations in the different areas.

Using the National Environmental Planning Vision monitor, the Delta Programme will monitor further spatial development in unfavourable areas and the hardening of the land surface for residential, working and infrastructure purposes in order to continue to flag these topics and put them on the agenda. The National Yardstick for a green climate-adaptive built environment and the spatial assessment framework that is currently being developed as a tool for the selection of climate-resilient locations provide an important substantive and practical basis for future new construction developments that take climate change into account. Questions about the legal ramifications are still being worked out in detail.

¹¹ See background document A 2022 Advisory Report from the Delta Programme Signal Group and the response from the Delta Commissioner.

2.1.2 Sea Level Rise Knowledge Programme

The Minister of Infrastructure and Water Management (I&W) and the Delta Commissioner launched the Sea Level Rise Knowledge Programme in 2019. The aim is to establish a clearer picture of the possible consequences of accelerated sea level rise on flood risk management, freshwater supplies and the sandy coast. The focus here is on the question of the extent to which existing policies and the existing water system, dikes, dams and defences are tenable and flexible in different scenarios for sea level rise. And also on establishing a picture of a range of possible, alternative, long-term solutions, including those involving sea level rise of up to five metres.

First phase

The study of the effects on the current water system (available on the website of the knowledge programme) shows that sea level rise will affect freshwater availability sooner than it will flood risk management. On the basis of the study, it is concluded, for example, that water demand will increase (for flushing) to address salinisation in the regional system on the coast. The rate and intensity of salinisation and flushing requirements vary depending on the region in question. Calculations indicate that, particularly in some areas near the coast, demand for flushing water will increase sharply when sea level rise reaches one metre. This makes it uncertain whether water management can continue to facilitate freshwater availability in all polder areas in the event of strong sea level rise. The initial results also show that, starting at 0.5 meters of sea level rise, gravity water discharge becomes almost impossible. In that case, much more pumping capacity will be needed at IJmuiden to prevent flooding

when there is extreme rainfall in the surrounding areas. Sea level rise will therefore lead to an increase in salinisation and make freshwater task more daunting. However, the increase in periods of low river discharges and water shortages will have a larger effect on salinisation and the challenge than sea level rise.

In the area of flood risk management, sea level rise means that more coastal sediment is needed to maintain the current coastline. The present system constitutes a sound basis for the future. The current Flood Protection Programme works with a sea level rise of 0.85 meters by 2100. Against the backdrop of accelerating sea level rise, storm surge barriers, dikes and dams will have to do more in terms of flood risk management to maintain the current protection standards. This will require ongoing investment in flood risk management. Additional space will therefore be needed to meet that challenge for the future. The Minister of I&W informed the House of this on 6 June 2023.¹²

Area-specific meetings have worked out possible solutions for the long term for levels of sea level rise at which existing strategies and the flexibility of those strategies may come up short.¹³ Steps are also being taken to explore how space should be earmarked now to allow for the implementation of any measures required for future water runoff, and for the possible construction of flood defences and water storage facilities. These insights were developed during regional

¹² Parliamentary Papers II 2022-2023, 32600-J no. 7

¹³ The reports of the area meetings can be found on the Sea Level Rise Knowledge Programme's website



meetings in the sub-programmes of the Delta Programme attended by representatives of government authorities that are responsible for water management and spatial planning, alongside to representatives of NGOs and the major investment agendas in the areas of construction, infrastructure, sustainable energy, nature and agriculture. In addition to these area meetings, three consortiums will deliver technological-physical and spatially realistic elaborations of three possible solutions (Seaward, Protect and Flexibility) at the end of the first phase of the research programme. Government authorities, knowledge institutes and business are working together in these consortiums.

The first phase of the Sea Level Rise Knowledge Programme will conclude in late 2023 with an interim report that will bring the principal results together and, with the KNMI'23 Climate Scenarios for sea level rise, provide an overview.

Second phase

The second phase of the Sea Level Rise Knowledge Programme (2024-2026) will focus on whether the existing strategies involving minor modifications can be maintained for longer and on impacts on functions such as agriculture, nature, sustainable energy, shipping and housing construction. The outcomes, in conjunction with the possible solutions for the long term, constitute the basis for formulating adaptation pathways that provide a picture of when, and which, measures are needed, the associated sea level rise, and how to make the required decisions and preparations in good time. That will be done for several scenarios, including the more extreme 'low probability-major consequences' scenario, in which Antarctica's land ice melts. In addition, the knowledge

programme in this phase will also develop knowledge about the governance issues associated with adaptations in response to sea level rise.

Alignment with new Spatial Policy Document

The Sea Level Rise Knowledge Programme and the work leading to a new National Spatial Policy Document are closely aligned. The National Spatial Policy Document will replace the National Environmental Vision (NOVI) in 2024 as the overall guide for national policy targeting the living environment. In the lead-up to the publication of the document, and as part of the Plan EIA process, an examination is being conducted of how the possible solutions for the long term from the knowledge programme affect other spatial planning options. Ultimately, on the basis of the national programmes, the provincial NOVEX process and assessments of the long term, the paper sets out decisions for the spatial development of the Netherlands between now and 2030. It also sets out a direction for the Netherlands of 2050 and 2100. Here, the guiding principles emphatically include keeping options open for the long term and avoiding lock-ins.

2.1.3 Pluvial and River Flooding Policy Platform

In December 2022, the Pluvial and River Flooding Policy Platform released its final advisory report. The policy platform, which included the Delta Commissioner, was set up to learn lessons from the extreme rainfall in July 2021 in an area half the size of the Netherlands that resulted in severe flooding and problems with water in Limburg, Germany, Belgium and Luxembourg, with more than 200 deaths and billions in damage. Rainfall of this magnitude

and intensity is rare but it will become more frequent. Problems with excess water and even severe flooding are inevitable but good preparations can limit the consequences and prevent social disruption. In its final advisory report, the policy platform recommends expanding the principle of multi-layer flood risk management from three to five layers. It proposes adding an additional, fourth layer – 'recovery' – and an integral basic layer – 'water awareness'.

Numerous functions are crucial to mitigate the effects of calamities: electricity, drinking water, telecommunications, access to hospitals, access to emergency services and evacuation routes. These vital and vulnerable functions therefore require greater involvement and more intensive collaboration in the safety regions. Another concrete recommendation is – in addition to the existing six-yearly local and regional stress tests for spatial adaptation – to conduct supra-regional stress tests. The aim of these tests is to establish a picture of the consequences of an extreme event at the scale of the water system for specific locations or infrastructure in order to make it possible to identify measures that mitigate the consequences. The focus, standardisation, and the implementation of concrete measures for consequence mitigation require additional efforts. On the basis of the results of these stress tests, parties involved in the Delta Programme for Spatial Adaptation alliance will start work on risk dialogues and measures. This means that the next round will have to formulate the principles and goals of the stress tests and dialogues in more concrete terms than in the first round, which was conducted after 2017. This will make the results more comparable and allow them to be aggregated in order to establish a regional and national picture of current

vulnerabilities and progress on measures. The security strategy for the Kingdom of the Netherlands refers to climate change as a major catalyst for a range of threats to national security. The capacity to adapt to climate and natural disasters must therefore be increased, for example through climate-resilient spatial planning. The climate mitigation and climate adaptation action line in this security strategy lists priorities for the period 2023–2029 with respect to spatial planning and cascade effects for vital infrastructure, and the approach to wildfire prevention and suppression.

2.1.4 Intensification of knowledge and research on climate adaptation

There are many new initiatives that are using knowledge, research and innovation to commit to an integrated approach with long-term sustainability, climate adaptation, and climate resilience as long-term goals. The interaction between climate adaptation and other major transitions, including the energy, commodities, agriculture and housing transitions, has an increasingly prominent position on the research agendas. Through the National Growth Fund, the government is investing € 110 million in the NL2120 knowledge and innovation programme. Other initiatives from consortiums of knowledge institutes, as well as public and private organisations, are also focusing on an integrated approach to these major transitions, each of which are laying claim to scarce space for themselves. Examples of initiatives targeting long-term spatial development to which the Delta Programme establishes connections are the NL2021 vision outlook (Wageningen University & Research), the Water Technology Growth Plan (National

Growth Fund), Red & Blue (a study by the Netherlands Organisation for Scientific Research looking at the contribution of the real-estate sector to climate adaptation), Redesigning the delta (Delft University of Technology), NL2121: Land with a Plan (KuiperCompagnons), the Netherlands Climate Research Initiative (KIN), Waterscapes (Netherlands Organisation for Scientific Research) and the Stars4Water programme that was recently approved by EU Horizon Europe. Contacts with initiatives of this kind are important for the Delta Programme in order to maintain an overview (regional sub-programmes are often approached as cases), to pick up new insights quickly, share them, and – if there are relevant outcomes – to include them in proposals from the Delta Commissioner for the Delta Programme, for example as part of the process of periodical evaluation. These processes can therefore generate input for administrative and political decision-making in the context of the Delta Programme.

The development and sharing of knowledge about climate adaptation against the backdrop of the broad spectrum of major transitions require a significant knowledge impulse. Extending the multidisciplinary and trans-disciplinary knowledge base for government authorities, stakeholder organisations and business should result in the structural enlargement and enrichment of the knowledge infrastructure in the domain of delta management and adaptation strategies. Achieving true valorisation and maximum synergy with the Delta Programme depends on the establishment of connections between these initiatives and the Delta Programme and other existing programmes, lines of activity and

government structures (including the associated administrative bodies).

2.2 More routes to a climate-resilient future: financial sector

Speeding up the agendas for flood risk management, fresh water and spatial adaptation provides the Delta Programme with the opportunity to extend the network of actors involved in climate adaptation and to strengthen alliances. In the years ahead, the Delta Programme is certainly also counting on the financial sector committing more to climate adaptation.

Interest in the financial sector in climate mitigation and adaptation is growing, in part because of new supervisory and reporting requirements that grant an increasingly important role to the assessment of climate risks. This means that climate mitigation and adaptation are also very much on the agenda of banks, insurers, pension funds, institutional investors and the regulatory authorities (the Dutch Central Bank (DNB) and the European Central Bank (ECB)). And for good reason. The sector is exposed to risks if investments due to climate change prove less profitable than expected and if climate damage increases. At the same time, the sector has instruments to encourage and accelerate the transition to a climate-resilient future, such as financing conditions, investment portfolios, and insurance products and premiums. The use of these instruments will be important nationally and internationally, and this is very important for the agendas of the Delta Programme. The Delta Programme and the Ministry of Infrastructure and Water Management (I&W) are working together, with the



Ministries of Finance, Agriculture, Nature and Food Quality, and the Interior and Kingdom Relations (BKZ), participating in relevant networks and identify promising instruments for the financial sector. There are four important tracks for the Delta Programme:

Presentation

The Netherlands is the world's safest delta but, because of a lack of adequate knowledge or information, the picture that people have of flood risk management in the Netherlands is unclear. For example, because our country is largely below sea level, it is sometimes equated internationally with largely unprotected deltas such as Bangladesh. If the protection of the Netherlands is not properly appreciated, the flood risk is exaggerated. This can have unintended consequences as a result of factors like the incorrect pricing of risk and the reduced availability of insurance, financing and investment from financial institutions. This could reduce the value of assets and damage the business climate in the Netherlands. It is crucial to convey a clear picture about flood risk management in the Netherlands. The Ministry of Infrastructure and Water Management and the Delta Commissioner, to some extent in consultation with the Ministry of Finance, are working on better communications tools targeting the financial sector and making data available about risks and current protection arrangements based on adaptation at the national, regional and local level, and at the level of individual buildings.

Insurance cover

Internationally, levels of damage caused by climate disasters and natural disasters are increasing. Insurers are

actively exploring how to prevent damage and how to establish a clear insight into risk factors and proper cover for them. After the floods in Limburg in 2021, it became clear that local people and businesses in high-risk areas were insufficiently aware of the risks and danger of flooding and the limited cover afforded by their insurance policies. In response to the events in Limburg, an interdepartmental exploratory study was launched to investigate the insurability of climate damage further and propose possible solutions. In addition, the final advisory report from the Pluvial and River Flooding Policy Platform includes a recommendation about improving climate resiliency options in insurance terms and conditions. The Delta Programme is supporting these efforts. It is essential for the commitment to flood risk management to be maintained, regardless of the safety net afforded by insurance or the limitation of other forms of subsequent damage. Insurers focus on prevention and flood mitigation at the property and infrastructure level; the Delta Programme focuses on reducing the probability of flooding. A balanced system of risk reduction and consequence mitigation is crucial for the Netherlands.

Financing

At present, government and public funding play a particularly strong role in climate adaptation. For example, BNG Bank helps municipal authorities and housing corporations with the financing of sustainability, including climate adaptation. The same applies to the Dutch Water Authority Bank (the NWB Bank). Furthermore, the NWB Bank is also the main financier of the water authorities. In addition, there are regional and local subsidy schemes for climate adaptation. Interest

from the private financial sector in working on climate adaptation is increasing. It is expected that this development will continue and that the private sector will make a more significant contribution to climate adaptation (and the stimulation of adaptation) in the years ahead, both by providing financial products to encourage adaptation and by pricing risks (see also Section 7.3).

Urgency of public-private partnerships

The 2021 floods in Limburg made it clear that climate change can inflict major material damage. The estimated damage in Limburg and parts of Noord Brabant was € 383 million¹⁴; total damage in Germany, Belgium, Luxembourg and the Netherlands is estimated at € 43 billion.¹⁵ This awareness, the introduction of more climate-related legislation and stress tests mean that the financial sector considers climate to be one of the most important risks. It is important for the financial sector to be familiar with the risks of climate change and to take action to manage them. The next step is to determine how the financial sector, in collaboration with the government, can speed up its contribution to a climate-adaptive Netherlands.

The financial sector itself has launched a Climate Adaptation Working Group under the Sustainable Finance Platform of the DNB. In 2020, the Climate-Resilient Together Platform conducted an initial exploration of the role of financial institutions for the structuring of the physical living environment in climate-resilient ways.

¹⁴ Parliamentary Paper 32698, no. 75

¹⁵ www.eea.europa.eu/ims/economic-losses-from-climate-related



Following on from this exploration, several initiatives were launched to work it out in more detail. Advisory reports from two public-private initiatives are expected to become available in 2023: the Climate Adaptation Working Group of the Sustainable Finance Platform and Climate-Resilient Netherlands, which was initiated by the Deloitte Impact Foundation. During the National Delta Congress on 9 November 2023, particular attention will be paid to the financial sector and public-private partnerships, and the Climate-Resilient Netherlands report will be presented.

2.3 More routes to a climate-resilient future: international developments

2.3.1 International rivers and groundwater stocks

Rivers and groundwater do not respect national boundaries. Measures taken by neighbouring countries in and around their rivers can reduce, but also exacerbate, the challenges facing the Netherlands. And vice-versa. Obstacles to shipping in the Netherlands, for example, can cause economic problems upstream. The same applies to international groundwater stocks. Coordination and knowledge exchange with respect to these measures are very important for the Netherlands. Here, the Delta Programme focuses where necessary on supporting international consultations organised by the Ministry of Infrastructure and Water Management. Major challenges are already being seen in Dutch rivers. River functions may be subjected to further pressure as a result of changes in climate and riverbeds. The amount of water that enters the Netherlands in wet and dry

conditions is directly linked to developments upstream in the international basin. In 2021, the Delta Commissioner therefore recommended the establishment of a Knowledge Programme for Transboundary River Discharges and Discharge Distribution.

A review conducted by Deltares shows that a lot is already being done with respect to knowledge development for the future of rivers, both in the Netherlands and internationally (including in a European context). This means that an entirely new knowledge programme is not required. The experts interviewed do believe it is necessary to look further in time and space (to 2050/2100), at the system as a whole, and beyond country and management boundaries, using the most integrated approach possible.

At the request of the Ministry of Infrastructure and Water Management (and specifically the Water and Soil Directorate-General), Rijkswaterstaat has drawn up a River Knowledge Agenda: an overview of the knowledge that still has to be developed for the structuring and management of the major rivers. The knowledge questions relate to topics covered by the political responsibility of the ministry: the discharge of high water, freshwater availability, navigability, water quality and river nature. The knowledge agenda is updated regularly.

Knowledge about the international nature and behaviour of rivers is becoming increasingly important. The Integrated River Management programme is working on policy decisions for future-resilient and climate-robust spatial planning for the rivers. The IRM implementation programme involves cooperation with the Dutch

secretariats and delegations of international Meuse and Rhine bodies. International agreements have consequences for the structuring and functioning of our rivers, and vice-versa. The policy decisions are expected to be available for viewing in a draft programme under the Environment Act (POW-IRM) in early 2024 prior to their subsequent adoption. Policymakers, managers and researchers can use the IRM knowledge agenda together to set priorities and programme the river research.

2.3.2 UN Water Conference

From 22 to 24 March 2023, the first United Nations water conference in nearly fifty years took place in New York. The Kingdom of the Netherlands co-organised the conference with Tajikistan. The aim of the Netherlands at the conference was to promote a more integrated systemic approach worldwide. During the conference, a Water Action Agenda was adopted with actions and commitments from member states and organisations. The Ministry of Infrastructure and Water Management launched the International Panel for Deltas and Coastal Areas (IPDC) at the conference. This is a coalition of countries and islands committed to working on their own national adaptation strategies and setting an example for other countries (www.deltasandcoasts.net). If requested to do so, the Delta Programme will support further knowledge development and exchange for the IPDC. Furthermore, the Netherlands is contributing to the Water Action Agenda in the areas covered by Water and Soil as Leading Factors, the economics of water and improving data availability.



2.4 More routes to a climate-resilient future: social engagement and intergenerational solidarity

Everyone in the Netherlands has an interest in making the country climate-resilient. They experience the consequences of problems with excess water, extreme water shortages or heat.

2.4.1 Social resilience

In its advisory report published in December 2022, the Delta Programme Signal Group argued in favour of identifying communications resources that reach a broader group of citizens in order to further social resilience to climate adaptation. The primary focus is on channelling targeted information through municipalities and water authorities to different groups of residents in order to educate them about climate risks and how the Netherlands has to be made climate-resilient. And about the risks to be accepted and how society as a whole and everyone individually can cope with the consequences.

Social resilience is the capacity of individuals and groups to cope with both short-term shocks and gradual long-term changes. In terms of climate change, this means dealing with both the extreme events occurring now – such as floods, heat waves, water shortages and extreme rainfall – and long-term developments. Examples include salinisation, land subsidence, changes in the discharges from major rivers and sea level rise. The Delta Programme Signal Group advises research into psychological and sociological processes that contribute to social resilience in relation to climate adaptation.

Older people living alone and households in social housing should also be in a position to make the transition to climate-resilient housing. That begins with honest information about preventing and coping with water and climate risks in their own living environment. And there also has to be a realistic picture of people's own actions and government action in this respect. Ultimately, this should result in a society that is more resilient and therefore able to respond robustly when times require it.

People can also contribute to solutions themselves, for example by replacing tiles in the garden with greenery. That furthers engagement. The direct involvement of the Dutch people in the Delta Programme is organised in the various sub-programmes. In the sub-programmes, the Delta Programme will be making an assessment in the time ahead of where and how it will be possible to strengthen engagement.

2.4.2 Intergenerational solidarity: letter from young people for 2024 Delta Programme

A special group of the population are young people, the vanguard of the generations to come. The Delta Programme is working on their future. So young people are important for the Delta Programme. The promise of the Delta Programme is to pull out all the stops to keep the Netherlands safe and liveable, for present and future generations. That is why new ideas and techniques devised by young people and the insights they acquire must be heard. The Delta Commissioner regularly invites students, recent graduates and young professionals to attend Delta Programme activities. The aim is to increase youth engagement across the entire spectrum of the Delta

Programme, not only in the themes and areas, but also in the Sea Level Rise Knowledge Programme. This is done by organising discussions with young people and encouraging young people to attend the annual Delta Congress to talk to more experienced professionals. That encourages people to learn from one another.

As input for this 2024 Delta Programme (DP2024), young professionals and students wrote a letter with their vision from the Delta Programme at the request of the Delta Commissioner.¹⁶ They based their vision on the responses of 87 young people to the survey conducted in preparation for that letter. Among other things, the writers of the letter recommended applying the Generation Test of the Young Climate Movement to the Delta Programme. This test ensures that the interests of subsequent generations will be made clearer and be considered in today's decisions. The students and young professionals also urged giving greater consideration to vulnerable groups and groups in society that are socio-economically disadvantaged. The survey in preparation for the youth vision showed that young people are concerned about whether the Delta Programme adequately takes into account socio-economic inequality and the vulnerability to climate change of disadvantaged groups in society. The young people advised the integration of inclusiveness in the design process and decision-making about the Delta Programme. Other recommendations from the young people relate to raising awareness, international collaboration and

¹⁶ See background document B Letter from young people on DP2024 and response from the Delta Commissioner. (in Dutch)

establishing connections with other transitions and challenges. Some of the young people's recommendations can be found in this DP2024. The full letter can be found as a background document (in Dutch) accompanying this DP2024.

Generation test

With the Young Climate Movement and others, the Delta Commissioner will be looking at how the generation test can take shape in the Delta Programme and be applied in the periodical evaluation of the Delta Decisions and preferred strategies in the 2027 Delta Programme (DP2027). For example, Bureau SIRA developed a generation test with the Ministry of the Interior and Kingdom Relations and with contributions from the Young Climate Movement and the SER Youth Platform. The test that will be developed will be tried out on one or two projects in the Delta Programme and then refined. All the participants in the Delta Programme will have access to it so that they can use it in their decisions for the periodical evaluation. [See also the Young Climate Movement's water vision.](#)

Inclusiveness

Certain groups, such as highly educated people, are over-represented in the delta community and the water sector. This means that the ideas which are developed are perhaps based on a one-sided view and that communications may not adequately reflect the diversity of society as a whole. The Delta Programme focuses on everyone in the Netherlands. It is therefore important to pay more attention to the people who are not reached, or not enough, such as young people, people with more practical

education backgrounds, people who speak other languages, the hard of hearing and the visually impaired. To ensure that everyone knows how they can contribute to a Netherlands that will be prepared for a rapidly changing climate, the Delta Programme is committed to:

- Dialogue with partners and umbrella organisations about improving the connections with society as a whole.
- Strengthening communications with, for example, the suggestions from the national government in this area with respect to using clear language, digital accessibility, taking cultural differences into account and avoiding stereotypes.
- Helping participants in the Delta Programme to reach people affected by their measures and projects. The Delta Programme also works with the Our Water alliance in this respect (www.onswater.nl).

2.4.3 Advisory report from Physical Living Environment Consultation Body

Climate adaptation affects the whole of society and requires broad involvement. Participation is therefore an important pillar under the Delta Programme. Participation is organised on different scales and in different stages of planning and implementation. It is seen in concrete projects but also in area processes, working sessions and workshops in the sub-programmes. At the national level, the Physical Living Environment Consultation Body (OFL) supports participation. The OFL issues an annual advisory report on the Delta Programme. In addition, the OFL organises informal consultation that allows members to report signals early. In 2022, the informal consultations were devoted to the coordination of the Delta Programme and the National Programme for

Rural Areas, and members were involved in thinking about how to achieve synergy there.

The OFL issued a formal advisory report on DP2024 in May 2023.¹⁷ The OFL supports the signal group's recommendation to work on social engagement with an eye for justice and solidarity between the different groups facing climate challenges. To encourage engagement, they recommend setting out appealing perspectives rather than an exclusive emphasis on challenges and urgency. With the OFL and the regions, the Delta Programme is exploring innovative forms of participation in concrete cases, for example in the implementation of the major water storage agenda near 's-Hertogenbosch. Civil society partners from the OFL have expressed their concern about implementation capacity, particularly in the case of local government authorities. This requires prioritisation. Any failure to make this explicit will lead to unpredictable policies and a lack of clarity for social partners, including the business community. In these circumstances, they will not know what they can expect or what is expected from them. Finally, the OFL members and participants have advocated adopting an approach to the Delta Programme's mandate that is not strictly bound by the letter of that mandate. International matters and water quality, for example, are not covered by the mandate, even though the agendas require coordinated action.

¹⁷ [See background document C](#) Advisory document from the Physical Living Environment Consultation Body and response from the Delta Commissioner.



That message is clear and, within the legal frameworks governing the Delta Programme and measures based on the Delta Fund, it can be implemented where possible and links can be established.

2.5 Developments in the domain of the Delta Programme

The Delta Programme follows an adaptive approach since the knowledge base and circumstances are constantly evolving. These new insights are being given a place in planning and operations in the areas and themes. The Cabinet's letters on Water and Soil as Leading Factors, the Provincial Programmes for Rural Areas (PPLGs) and the starter packages for the physical living environment (NOVEX) were particularly relevant for the ongoing processes and keeping the preferred strategies up to date.

The provincial authorities shape the future spatial structure of the Netherlands in their regional plans. Coordination with the PPLGs and the Water Framework Directive (WFD) are some of the factors that are relevant for the Delta Programme. The PPLGs can get off to a flying start by taking advantage of the Delta Programme's consultative structures, area processes and implementation programmes. The PPLGs, the Delta Programme and the WFD will have to search for joint solutions for the sustainable planning of peatland areas, adequate supplies of good-quality water in areas of the country with sandy soils and areas affected by salinisation. This requires smart combinations of funding sources, such as the Rural Area and Nature Transition Fund, investments in the Delta

Plans from the Delta Fund, and regional co-financing. There are also strong links with other agendas. For example, the arrival of new water users such as hydrogen plants will have a direct effect on the freshwater agenda. Furthermore, declining water availability during dry periods with low river discharges may lead to problems with water quality at intake points for regional water systems and drinking water because discharges into the rivers continue during these periods, with high concentrations of substances in the water as a result. Drinking water companies are already being forced regularly to fall back on buffers and alternative sources.

Another development is the expected increase in demand for drinking water. RIVM has stated that – if nothing is done – there will be a shortage at all drinking water companies by 2030. Three in ten manufacturing companies already need more production capacity. Government authorities and drinking water companies are faced with the task of reducing drinking water demand in line with the parliamentary letter on Water and Soil as Leading Factors, but also of looking for new sources. This requires broad assessments of the long-term sustainability of the water system and other social agendas for which fresh water has to be available. Groundwater quantity and quality are – in addition to their importance for drinking water – also vital for nature, agriculture and industry.

2.6 Periodical evaluation of Delta Programme

Recent recommendations are leading to new emphases that the Delta Programme is developing further. At the start of the implementation phase of the Delta Programme in 2015, it was decided to conduct periodical evaluations of the content of the Delta Decisions and preferred strategies every six years. The results of the first of those evaluations were presented in the 2021 Delta Programme.

The process for the second six-yearly review began in early 2023, two years earlier than originally intended. That is because there are multiple developments that need to be taken into account. In addition to the policy developments referred to here, the insights from the recent IPCC reports, the KNMI Climate Scenarios for 2023, recommendations from the planning agencies, and the more demanding challenges in the spatial domain also make an evaluation necessary. This is compounded by the fact that the extreme weather of recent years has demonstrated that the volatility of climate change has been underestimated. It has also emerged that more knowledge about the climate system and water system does not always result in a reduction of the uncertainties or bandwidths for policy decisions and measures. In some areas, that uncertainty actually increases. An example is the pace of sea level rise.

Transnational connections at the level of the entire river system and the expected intensification of knowledge about, and research on, climate adaptation (for example



through the Netherlands Organisation for Scientific Research, the Dutch Research Agenda, the Netherlands Climate Research Initiative and Growth Fund investments) are also incentivising acceleration. Moreover, the speed of climate change requires an exploration of a possible shift from adaptive delta management to a transformative approach. That may involve abrupt changes at the level of the structuring or management of the water system as a whole. At this stage, that still sounds abstract. But if water management runs up against its limits, or if it has already gone beyond them in some areas, sticking with what we know will probably not produce an answer to the problems of the future, or even the near future. That includes exploring turning points in physical conditions and considering policy tipping points, and these matters will have to be addressed in the Delta Programme.

In collaboration with knowledge institutes, the Delta Programme is working on the further development and expansion of the method of adaptive delta management. This is needed to develop transformative strategies and transition pathways. The transition pathways which have been developed show how it is possible to move from an existing situation to different scenarios for the long term. In the second six-yearly periodical evaluation (planned for DP2027), it will then be possible to put forward proposals and make agreements about the required building blocks for the transformations needed in the domain of water management and spatial development. Promising long-term perspectives and the associated measures will be identified in 2024 on the basis of climate change and its impacts. In 2025, the Delta Programme will take the step towards promising strategies, measures and potential

development pathways. On that basis, the Delta Programme will propose re-evaluated Delta Decisions, measures and/or preferred strategies in 2026.



Chapter 3

Flood risk management

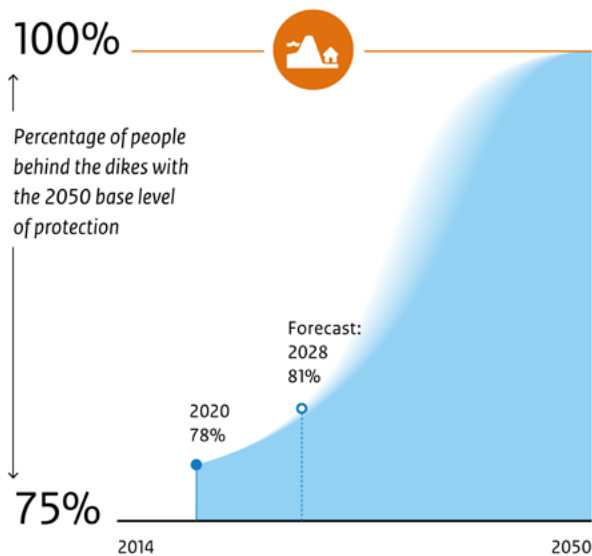


Dike with flowers, Culemborg, May 2023

By 2050, everyone in the Netherlands will have the base level of protection

What is the goal and what is our current position?

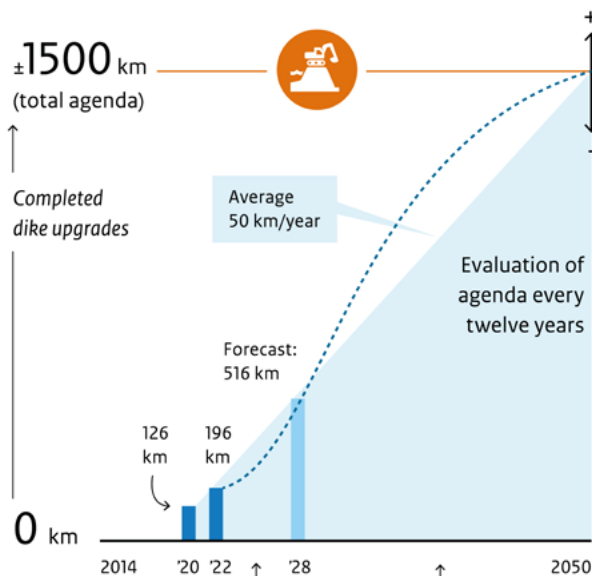
Policy goal: by 2050, everyone behind the dikes will have the base level of protection*



*probability of mortality due to flooding must not exceed an average of once in 100,000 years

How are the measures progressing?

Dike upgrades are the most important measure for achieving the base level of protection everywhere



Initial years for preparation, then leap in rate of completion

Key issues and opportunities

-  Set aside space around dikes for future dike upgrades
-  Do not allow any new construction in the riverbed
-  Where possible, combine the flood risk management agenda with other spatial agendas such as nature and infrastructure
-  Work on multi-layer safety, including in regional waters: also by raising awareness and resiliency



The agenda for flood risk management depends on the condition of the flood defences respective to the legal standards: which defences comply (or not) with the standards that have been applicable since 2017? The standards were set in the light of the expected risks in 2050 and they have therefore already factored in forecasts of population size and economic development. Every twelve years, the Minister of Infrastructure and Water Management (I&W) reports to the House of Representatives about the assessment of all primary flood defences. That provides an up-to-date picture of the condition of the those defences. The first national assessment round for primary defences based on the new standards began in 2017. It was implemented in an accelerated approach over a period of six years to establish a clear benchmark. This will result in the first Flood Protection Overview in 2023: a description of what is needed for the management, maintenance and upgrading of the primary flood defences. The second and third Flood Protection Overviews will follow in 2035 and 2047 respectively. In the meantime, Rijkswaterstaat and the water authorities are working on upgrading the flood defences.

3.1 Perspective for 2050 and later

Everyone in the Netherlands who lives behind a primary flood defence must have at least a base level of protection of 1 in 100,000 annually by 2050 at the latest. That means that the probability of a fatal casualty as a result of a flood is 0.001% per year. To achieve this goal, new safety standards for primary flood defences (dikes, dunes and storm surge barriers) have been in place since 1 January 2017. All these flood defences must comply with those legal standards by 2050.

81% by 2028

Of the approximately 8 million people living behind a primary flood defence in our country, about 78% already had the base level of protection in 2020. The completion of dike upgrades will raise this percentage to 100% on the road to 2050. Many dike upgrades are in the planning phase; they will move on to the operational phase in the years ahead. By 2028, the percentage of primary flood defences that comply with the base level of protection will have increased to about 81%.

3.2 Developments

First National Assessment Round completed

The water authorities and Rijkswaterstaat worked hard in 2022 to complete the assessment of primary flood defences on the basis of the 2017 flood protection standards. All the assessments had been completed in late 2022. In May 2023, the Minister of I&W sent the report of the Environmental and Transport Inspectorate (ILT) with the results of the

assessments to the House of Representatives. This report shows that 62% of the standard sections¹⁸ of the primary flood defences do not meet flood protection standards. This is in line with expectations because these are the initial assessments based on the new standards and instruments. Some of the standards are more stringent and they focus on the situation in 2050. Decisions are taken on the basis of this assessment about which parts of a dike should actually be upgraded. This will usually involve work on a section rather than the entire dike. The goal is for all primary defences to comply with the standards by 2050.

In 2023, the Ministry of I&W, in close coordination with the water authorities and Rijkswaterstaat, will draft the first National Flood Protection Overview. In this policy overview, the Ministry places the assessments in a broader context and interprets the results. This includes an overall cost estimate of the upgrade agenda that will be required. The Minister will send this policy overview to the House of Representatives in late 2023.

Start of second National Assessment Period

In 2022, development work continued on the instruments for the assessment and design of the primary flood defences. Using these amended instruments, management authorities will be in a position to initiate the second round of assessments for primary flood defences from 2023 onwards (LBO2; 2023-2035). These Assessment and Design Instruments (BOI) provide management authorities with better support in their work to determine flood probabilities.

¹⁸ Standard section: part of a primary flood defence covered by a separate standard.

3.3 Connections

Space for dikes, flood defences and our coast

Enough space is needed around dikes, dams, dunes and water-defence structures for upgrade operations, even after 2050.

Working with water authorities, provinces and municipalities, the Ministry of Infrastructure and Water Management is therefore updating the current earmarked zones around primary flood defences (dikes and the coast) on the basis of the latest information from the Sea Level Rise Knowledge Programme. Earmarked zones around primary flood defences are subject to limitations on the use of the area. The purpose of the updates is to streamline those zones and make them future-

resilient. This ensures that dike and coastal upgrades will continue to be possible in the future. The spatial plans and instruments of municipalities and provinces will be adjusted accordingly.

With increasing pressure on physical space, there is a constant search for sustainable combinations of functions. That also applies to any new earmarked zones around primary flood defences. The agenda for flood risk management does not stand alone. It is also linked to other environmental agendas such as nature and agriculture. Where possible, managers of flood defences elaborate the agenda for flood risk management as part of an integrated approach to other agendas in the physical environment.

No new construction in the riverbed

In the future, building in the floodplains (which are covered by the Policy Line for the Large Rivers) will no longer be allowed in order to ensure that new activities or structures in the riverbed will not make plans designed to make the rivers more future-resilient more expensive or

impossible, and result in more damage as a result of high water levels or floods.¹⁹ To this end, the Policy Line for the Large Rivers will be evaluated in 2023 and amended where necessary. The amended policy line will not apply to development locations about which administrative agreements have been made with the national government.

Multi-layer safety

To reduce the risks of flooding in the future, a stronger focus on multi-layer safety is required. In addition to prevention consisting of building and upgrading dikes and defences (the first layer), a broad view is needed of spatial planning behind the dike (second layer) and crisis management (third layer, see also Section 5.4). In this way, the delta can be made even safer. Climate-robust spatial planning is part of the Delta Programme for Spatial Adaptation.

On the basis of the events in Limburg in 2021, the Pluvial and River Flooding Policy Platform concluded that rapid and climate-robust recovery from damage (layer 4) and water awareness (layer 5) are also important to prevent damage and social disruption.

¹⁹ One of the planning decisions in the parliamentary letter on Water and Soil as Leading Factors, Parliamentary Paper 27625, no. 592.

3.4 Delta Plan for Flood Risk Management

3.4.1 Flood Protection Programme

The programming of the Flood Protection Programme (HWBP) for 2024-2035 can be found in [Annex 1](#).

Progress and programming

The aim of the HWBP alliance – the water authorities and Rijkswaterstaat – is to bring an average of 50 kilometres of primary flood defences up to standard each year. The total upgrade agenda is now estimated to include 1,500 kilometres and 426 structures. A total of 196 kilometres of dike and 51 structures have now been upgraded or declared safe. The HWBP programming for 2024-2035 includes about 100 dike upgrade projects, representing 814 kilometres of dike and 426 other engineering structures. A large proportion, consisting of some 575 kilometres, is in the implementation stage and these sections have reached one of the project phases: exploration, plan development or realisation. The ambition to upgrade 50 kilometres of dike each year is expected to be fulfilled by 2026.

Signals and new insights

On the basis of the first National Flood Probability Assessment Round (LBO-1), the Ministry of I&W, in close coordination with the water authorities and Rijkswaterstaat, will present the National Protection Overview to the House of Representatives in late 2023. Water authorities may submit upgrade projects for dike sections that do not meet the standard to the HWBP. A clearer picture will be established in this way of the scope of the programme



Dikes in kilometres

Situation on benchmark date 31-12-2022



Number of engineering structures

Situation on benchmark date 31-12-2022



Legend: ■ Completed ■ Included in programme ■ Registered

Annual expected upgrades in number of kilometres

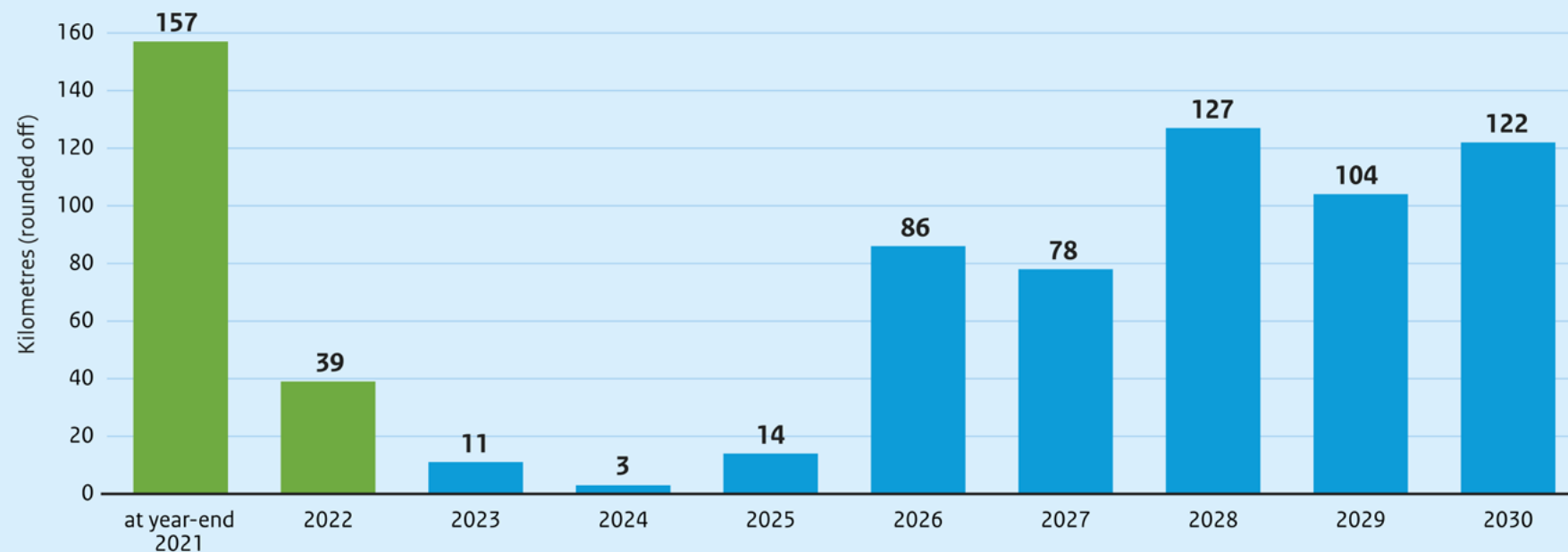


Figure 2 Current situation with the status of HWBP projects as at 31-12-2022

between now and 2050. The largest risks are price increases and failures to meet schedules. Several measures, such as the implementation plan ‘Towards a realistic and reliable Flood Protection Programme’, anticipate these risks. The reasons for cost increases are being identified and several processes have been initiated to look at financing between now and 2050 ([see also Section 7.2](#)).

Innovations can make the upgrading of dikes smarter, more economical and more sustainable. The HWBP invests an average of € 10 million annually in innovations. The total reported savings from HWBP innovation projects until year-end 2022 amount to € 370 million in return for an investment of € 139 million. The HWBP wants to triple these savings by 2030.²⁰ Some twenty innovation projects are currently in progress.

Linking sustainability and spatial quality agendas

The HWBP is leading the way in the use of zero-emission equipment. It monitors the structural safeguarding of sustainability and spatial quality in all HWBP projects as part of the evaluation of the Programmatic Approach to Sustainability and Spatial Quality. The approach is being extended by establishing connections with other programmes – such as the Programmatic Approach for the Main Water System (PAGW), the Integrated River Management (IRM) programme, the Water Framework Directive (WFD) and the National Programme for Rural Areas (NPLG) – before the projects start. In addition to the increasing focus on circularity, and preventing and

²⁰ HWBP Knowledge & Innovation Portfolio 2023.

reducing emissions of CO₂ and nitrogen, nature and biodiversity will be higher on the agenda. The same applies to cultural heritage as a carrier of spatial quality. Our flood defences and peatland areas often date back centuries, and they illustrate the knowledge-rich way people have to working with water. As a result, integrated area development is an option that is being taken more and more.

This creates space for water-robust and more natural solutions for flood risk management.

National flood defences

The Delta Fund includes funding for the upgrading of national flood defences. The assessments of those defences using the new flood protection standards have been completed. Action perspectives are currently being drafted for the defences that do not comply with the standard. An initial Implementation Programme for the Primary National Flood Defences was published in mid-2023.

3.4.2 Flood Protection Programme 2

The Second Flood Protection Programme (HWBP-2), the predecessor of the current HWBP, is in the completion phase. The Eemdijken-Zuidelijke Randmeren dike upgrade operation, which includes 22 kilometres of dikes, was completed in 2022. This means that, at year-end 2022, 331 of the planned 362 kilometres of dike had been upgraded. The latest project in this programme is now proceeding apace: the upgrade of the Markermeerdijk Hoorn-Edam-Amsterdam dike over a distance of 31 kilometres.

The first part of this operation was completed in early 2023. The entire project is expected to be completed by late 2027.²¹

²¹ More information can be found in the 23rd progress report for HWBP-2. Parliamentary Paper 32698, no. 79



Chapter 4 Fresh water



Improving water allocation Bloemers/Ufford in Land van Maas and Waal (Gelderland), June 2023

The Netherlands will be resilient to water shortages by 2050

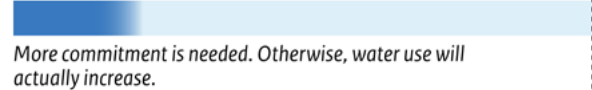
What is the goal and what is our current position?

The resilience goal is being worked out in concrete terms. Measurable targets apply from 2028 onwards. The current strategy is:

1. Water and soil lead spatial planning



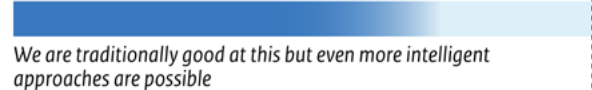
2. Economical use of water



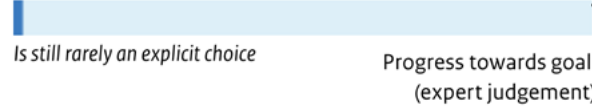
3. Better water retention



4. Smart allocation of water

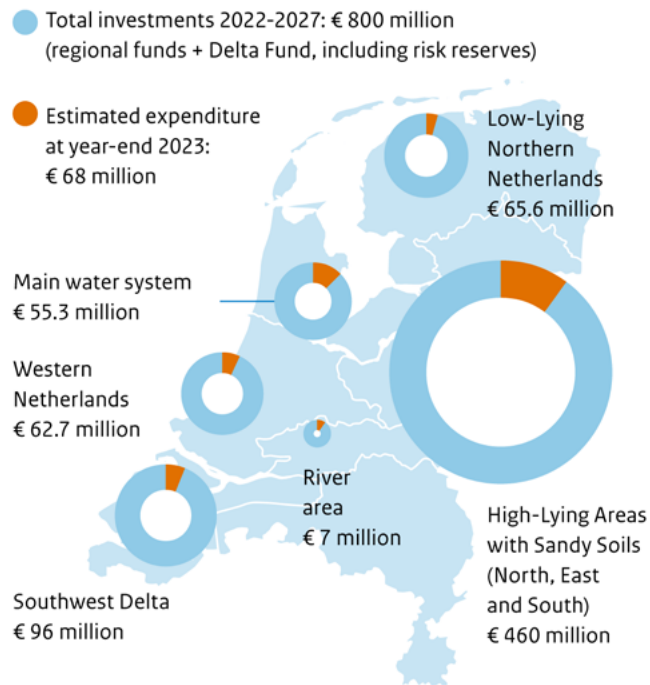


5. Acceptance of damage/residual damage



How are the measures progressing?

All the regions are working on resilience to water shortages; the emphasis is on water retention.



Key issues and opportunities



Water shortages are an urgent transnational problem, look for ways to work together



Water allocation when river discharges are low affects agendas throughout the country



The limits are being reached of what can be achieved in water management with technological measures: start the transition



Integrate the freshwater agendas in the National Programme for Rural Areas and the National Spatial Policy Document



Encourage all sectors to become resilient to water shortages themselves



The overarching goal of the Freshwater Delta Programme is to ensure that the Netherlands can cope with water shortages by 2050. This resilience target has been formulated as five subsidiary targets:

- maintaining a healthy and balanced water/groundwater system;
- protecting critical user functions against water shortages;
- using the available fresh water effectively and economically;
- improving the competitive position of water-dependent sectors;
- developing knowledge, expertise and innovations in the water domain.

The ambition for the main water system is to make it resilient to droughts that occur once every twenty years. In order to achieve that ambition, the measures taken by the national government (Rijkswaterstaat and the Ministry of Infrastructure and Water Management) and freshwater regions (provincial authorities, water authorities, drinking water companies, location managers and others) have been set out in detail in the Freshwater Delta Plan for the second phase: 2022-2027. But the climate is changing faster than expected and water shortages have now become almost an annual phenomenon, particularly in the High-Lying Areas with Sandy Soils. In order to address the growing challenges in time, the pace of implementation of the agreed measures will have to increase. All the partners have to get to work and not shy away from difficult decisions for the years after 2027. Freshwater shortages are an urgent reality. Postponement is not an option.²²

4.1 Perspective for 2050 and later

The strategy of ‘Making the Netherlands resilient to water shortages by 2050’ adopted in the re-evaluated Delta Decision for 2021 is based on the following principles from the National Environment Planning Vision (NOVI): land use adapted to water availability, economical use of water, retaining water in the ground and national buffers, optimising freshwater distribution and accepting damage. In some areas, the capacity of nature and the soil

²² See background document D, Freshwater Delta Programme: Progress in 2022

and water system to cope is being exceeded due to factors such as sea level rise, low levels of rainfall and river discharges. The limits of what can be done with technology to prevent freshwater shortages and salinisation are coming into view here. In these areas, sectors are preparing for the transition to a future-resilient situation.

Distributing and retaining water in intelligent ways

The packages of measures in the Freshwater Delta Plan for 2022-2027, which are worth € 800 million, follow this strategy. Most progress is being made on smart water distribution and retention. Thanks in part to the implementation of the recommendations of the Drought Policy Platform and to measures from the first phase of the Freshwater Delta Plan – such as better regional priority sequences, more salt monitoring points to distribute water more intelligently between regions, and water retention in the High-Lying Areas with Sandy Soils – the Netherlands was able to weather the 2022 drought better than that of 2018.

Resilient freshwater users

More needs to be done to achieve the objectives by 2050, particularly against the backdrop of rapid climate change, increasing demand for freshwater and the energy transition. The packages of measures for the years after 2027 should focus even more on no-regret measures, better water retention, spatial planning, the effective and economical use of water and business transitions so that all sectors can cope with water shortages and salinisation in flexible ways. The Freshwater Delta Programme is

testing future strategies and measures for after 2027 to determine their resilience until at least 2100.

4.2 Developments

Water shortages and salinisation are on the increase

The KNMI 2023 Climate Scenarios show that water shortages are becoming more extreme. Areas of the country with sandy soils are becoming more vulnerable due to longer periods without precipitation. In addition, river discharges are falling in the summer and autumn, as a result of which the lower-lying areas of the Netherlands are also becoming more vulnerable. According to the Rhine Commission, the river discharge in the summer and autumn will decline further. In 2023, the Sea Level Rise Knowledge Programme looked at the impact of sea level rise on freshwater availability in the coastal regions and polders with saline seepage. The conclusion was that, even with limited sea level rise – which is expected before 2100 – the salinisation of coastal areas and water intake points will increase and it will no longer be possible to compensate with more flushing because river discharges will be too low during dry periods. This conclusion confirms the need for increased efforts in areas affected by salinisation to make sustainable transitions possible.

Water and Soil as Leading Factors and spatial transitions

The water and soil system determines the future spatial planning of the Netherlands. The goal of Water and Soil as Leading Factors is to provide enough clean water and healthy soil for all. The motto is: not passing on freshwater shortages to other users or areas, or to future

generations. The choices set out in the parliamentary letter on Water and Soil as Leading Factors have been formulated in practical terms as freshwater objectives for 2028-2033 (Freshwater Delta Plan, third phase). Many of these choices serve as boundary conditions for area-specific provincial plans and spatial arrangements.

Freshwater objectives

A range of policy evaluations have concluded that the goal of the Freshwater Delta Programme is still relatively abstract. The Delta Programme will therefore be formulating the freshwater objectives for the next period (2028-2033) in more concrete terms in 2024. The Delta Programme is elaborating the objectives and quantifying the attainment of those objectives on the basis of a set of national and regional indicators. The choices from the parliamentary letter on Water and Soil as Leading Factors, the intended transition in rural areas and accelerated climate change justify the re-evaluation of the freshwater strategy in a number of respects in the 2026 Delta Decision, with 2050 serving as the first milestone and looking ahead to 2100. In particular, the increased demand for fresh water to counter land subsidence and carbon emissions in peatland areas, ever-lower river discharges in summer and increasing salinisation make choices about water allocation, transitions and drastic measures more urgent and unavoidable. All this will be included in the ongoing process for the 2026 periodical evaluation of the Delta Decision.

Integrated River Management (IRM)

In 2023 and thereafter, the Minister of Infrastructure and Water Management, after consultation with the Administrative Platform for Water, will proceed with the preferred

decision on Integrated River Management with respect to the location of the bed and discharge distribution in the Rhine distributaries and the Meuse. The discharge distribution in the Rhine distributaries when water levels are low is crucial for the freshwater supplies of the Netherlands. Low river water levels determine groundwater levels in adjoining areas. Stress tests have shown that, without additional measures by 2050 (assuming the Steam 2050 scenario), the IJsselmeer will not have enough water to supply the northern Netherlands with fresh water once every five years, even though the goal is to restrict this probability to once every twenty years.

Concerns about operational capacity in the regions

There are numerous challenges around the corner for the regions. They will require robust administrative decisions, substantial human and financial resources, and other instruments. Those demands may exceed the current operational capacity of the regions and lead to delays in the implementation of freshwater measures.

4.3 Connections

Energy transition, housing construction, economic developments

Initiatives for new nuclear power plants and hydrogen plants require suitable locations where supplies of fresh water are guaranteed. Parties are also looking for subsurface locations for thermal energy systems. At the same time, sectors such as industry and agriculture are pushing for reductions in water use and smart recycling solutions. It is crucial to coordinate freshwater demand and supply here. Drinking water supplies – for the



growing population and economic developments – will already be under pressure by 2030 due to the limited availability of good-quality water/groundwater. Drinking water companies are looking for alternatives in consultation with the national government and the Freshwater Delta Programme.

National Programme for Rural Areas (NPLG)

The National Programme for Rural Areas grants a central role to the coordinated implementation of agendas for nature, water and climate, with a perspective for agriculture. The provincial area programmes of the NPLG include, among other things, measures needed to establish the hydrological conditions for Natura 2000 areas. In addition, they include measures for the large-scale restoration of brook valleys on sandy soils in relation to the achievement of the objectives for the Water Framework Directive (WFD) and the Nitrates Directive, where possible in conjunction with other freshwater agendas. The Transition Fund for Rural Areas and Nature is setting aside more than € 800 million for this purpose between now and 2035.

The Freshwater Delta Programme invested heavily in brook restoration in recent years and it is continuing to do so – € 300 million through to late 2027. The NPLG also includes the goal of slowing down land subsidence in peatland areas. This requires large amounts of water that cannot easily be supplied.

Integration of urban and rural areas

For many years now, the Freshwater and Spatial Adaptation Delta Programmes have been encouraging stress tests and risk dialogues for spatial adaptation and

area processes for the purposes of incorporating the challenge of water shortages in municipal spatial planning. This is an ongoing incentive for the integration of urban and rural approaches.

4.4 Freshwater Delta Plan

The national government and the freshwater regions are continuing to work on the Freshwater Delta Plan. They are doing this in phases. The first phase was from 2015 to 2021, and the second phase is from 2022 to 2027. The programme for 2024-2027 can be found in Annex 2.

First phase: implementation of final complex measures

Approximately 64.7% of the Delta Fund budget for the first phase has actually been spent. The Freshwater Delta Programme will be spending the remaining 35.3% between now and 2026. Between 2015 and 2022, 51 measures in the first phase were implemented, accounting for € 120 million. Nine smaller measures accounting for € 2.2 million will be completed in 2024. Four major complex implementation projects, with a total value of € 66 million, are still in progress: Climate-resilient Water Channel West Netherlands-route C and Measures for the upgrading of the Frisian IJsselmeer Coast through to year-end 2025; Implementation of Water Level Decree for the IJsselmeer and Supplies from Noordervaart through to year-end 2026. The longer implementation time is due to complex procedures, PFAS, land ownership and tendering issues.

Implementation of the Delta Plan, second phase (2022-2027)

The second phase of the Freshwater Delta Plan (2022-2027) began in 2022. The national government and the freshwater regions have agreed on an ambitious package of measures for this purpose of approximately € 800 million, double the amount for the 2015-2021 planning period (€ 400 million in total). € 250 million of this amount comes from the Delta Fund. Regional governments and other parties will contribute € 550 million. More than half of the investments have been designed to retain water better in the High-Lying Areas with Sandy Soils. The other measures focus on the more effective and efficient distribution of the available water, the use of alternative sources (such as effluent from wastewater treatment plants), the more robust/ climate-robust structuring and management of the water system, and innovations in, among other things, agriculture. The implementation of some measures began in 2023. The measure of the Rivierenland water authority, *Increasing the Bloemers-Ufford water supply*, has also been completed. The implementation of most measures will begin in or after 2024. The implementation of complex processes can be expected to continue after 2027 due to pressures on operational capacity in the regions, difficulties with land acquisition, complex permit procedures and price increases.





Chapter 5 Spatial adaptation



Delta Commissioner Peter Glas and Fien Dekker of Rain(a)Way at fifth anniversary of living lab De WaterStraat in Delft, May 2023

The Netherlands will be climate-resilient and water-robust by 2050

What is the goal and what is our current position?

Policy goal: by 2050, the Netherlands will be resilient to heat, water shortages, problems with excess water and the effects of floods

First round of stress tests-risk dialogues-implementation agendas

Second cycle starts in 2024 on all scales

Climate-resilient/water-robust in environmental visions of:

provincial authorities in 2022

municipal authorities in 2024

Embedding now in work processes and regulations

National vital and vulnerable functions: stress tests in 2021 and ambitions in 2023

Detailed picture has been developed, clear follow-up approach needed

Always act in climate-resilient/water-robust ways

Administrative will is there, money and time are limited

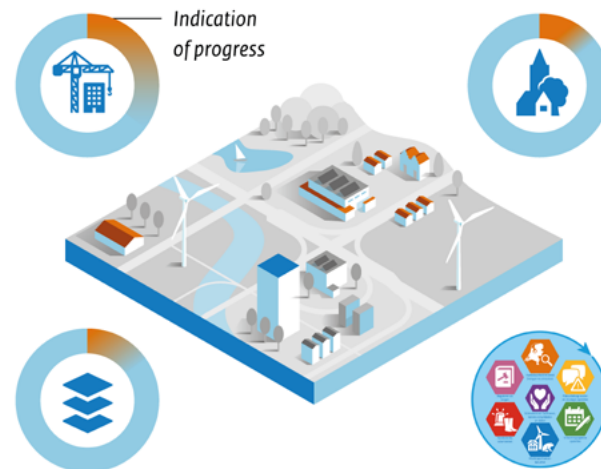
Progress towards goal (expert judgement)

How is spatial adaptation progressing?

Many measures are being implemented but we are still in the early stages. Water and Soil as Leading Factors provides support.

Strong focus on climate-adaptive new construction, in part because of the yardstick

Existing built environment: primarily local measures (partly due to stimulus scheme)



Linkage to spatial agendas

All government authorities very active and the seven ambitions for spatial adaptation

Key issues and opportunities

-  Make climate adaptation mandatory, end non-committal approach
-  Water and soil as leading factors: link spatial adaptation more to water shortages and land subsidence
-  Heat is receiving more attention but not yet enough: it is causing fatalities
-  Vulnerabilities on a supra-regional scale should also be considered, include them in risk dialogue
-  Provide structural funding and capacity for spatial adaptation



The climate is changing faster and faster. That goes hand in hand with more intense showers and periods of drought and heat. Municipalities, water authorities, provinces and the national government are using the Delta Programme for Spatial Adaptation to accelerate and intensify the transition to climate-proof spatial planning so that the Netherlands will be better prepared for weather extremes. The phased approach (see Section 5.4) is a major component of this response. The parliamentary letter on Water and Soil as Leading Factors is very important in this regard. The Delta Programme for Spatial Adaptation is committed to integral area-specific approaches because there are currently several issues involved. They involve dealing with nitrogen emissions, housing construction and the energy transition, all of which require appropriate formulation in terms of spatial planning. In the Delta Programme for Spatial Adaptation, considerable attention is also being paid to the modifications required in vital and vulnerable functions, for example mobility and networks for energy and telecommunications.²³

²³ See background document E: Progress Report on Spatial Adaptation for 2022 for more information about the progress made by the Delta Programme for Spatial Adaptation in 2022 (in Dutch).

5.1 Perspective for 2050 and later

The ambition of the Delta Programme for Spatial Adaptation is that, by 2050, the Netherlands should be resilient to heat, water shortages and problems with excess water, and the effects of flooding. In addition to the central government, provinces and water authorities, municipal authorities in all 45 DPRA working regions are also taking steps to achieve that ambition. Many measures are already being implemented, such as the construction of water squares and swales that prevent pluvial flooding in the built environment after heavy rainfall. Alongside the focus on problems with excess water, there is an increasing emphasis on mitigating the consequences of heat, water shortages and flooding. Nevertheless, the working regions together are still only in the early stages of making the ambition a reality. From 2023 onwards, the Delta Programme for Spatial Adaptation will be formulating concrete intermediate objectives so that everyone involved knows what is needed to achieve the ambition *and* to ensure that progress can be monitored better.

Moving towards climate-robust spatial planning should involve conducting stress tests and implementing measures that reduce vulnerability to problems with excess water, heat, water shortages and flooding in an area. But this should also certainly involve the full inclusion of climate adaptation in all spatial investments and developments in the elaboration of other policies or through management and maintenance. This work requires the cyclical completion of the steps in the

approach of the Delta Programme for Spatial Adaptation (see also Section 5.4).

The work of the Delta Programme for Spatial Adaptation continues to focus on the spatial choices and measures needed to make the Netherlands resilient to the consequences of weather extremes and sea level rise. Operational capacity continues to be a concern here. In 2023, two working groups will start work on the monitoring and structural funding of spatial adaptation. In addition, the Delta Programme for Spatial Adaptation will investigate what concrete intermediate objectives can be used to make it clearer what efforts are needed and to ensure that progress can be monitored better. [Background document E](#), Progress Report on Spatial Adaptation for 2022, (in Dutch) includes more information about the progress made in the 45 DPRA Working Regions in 2022.

5.2 Developments

Supra-regional stress tests and dialogues

In 2022, the Pluvial and River Flooding Policy Platform recommended conducting supra-regional stress tests, in addition to existing local and regional stress tests, from 2024 onwards. The goal of these stress tests is to establish a clearer picture of the supra-regional risks of extreme precipitation events and a better understanding of the potential cascade effects. Reports on the supra-regional stress tests will be sent to the Administrative Decision-Making Platform for Water. The Delta Programme for Spatial Adaptation is helping with the development of

these stress tests, which should be aligned as closely as possible with the stress tests in place so that they complement and strengthen each other.

The insights generated by stress tests on a range of scales must be combined in risk dialogues. It is also necessary to look at all the climate themes in conjunction and identify the spatial decisions and measures that are required. This also results in a better understanding of the interaction between the measures needed for spatial adaptation, fresh water and flood risk management (multi-layer safety).

The findings of the Sea Level Rise Knowledge Programme should also be considered here.

Water and Soil as Leading Factors and National Yardstick

New frameworks for climate adaptation are being developed at the national level, for example through the National Yardstick for a green climate-adaptive built environment and the parliamentary letter on Water and Soil as Leading Factors. The National Yardstick is an elaboration of the National Approach to Climate Adaptation in the Built Environment of the Ministries of the Interior and Kingdom Relations (BZK), Infrastructure and Water Management (I&W) and Agriculture, Nature and Food Quality (LNV). In addition to themes from the Delta Programme for Spatial Adaptation (mitigating the consequences of flooding, problems with excess water, heat and water shortages), the National Yardstick also focuses on land subsidence and biodiversity. In addition, the national government is working on a spatial assessment framework for climate-adaptive site selection in which water and soil will be the leading factors. This is the result of the elaboration of one of the principles in the parliamentary letter on Water and Soil as Leading Factors.

The spatial assessment framework provides guidance based on the water and soil system and it targets climate-adaptive site selection, while the National Yardstick concentrates on the climate-adaptive and green design of new construction activities. Pending the legal embedding for the National Yardstick and the spatial assessment framework, the national government is asking local government authorities to apply the instruments in practice now as much as possible.

Climate Adaptation Stimulus Scheme

The national government's provisional Climate Adaptation Stimulus Scheme (2021-2027; € 200 million from national government and two-thirds in co-financing from the regions) is on track; as at year-end 2022, € 117 million had already been allocated. 2023 is the last year for applications for this stimulus scheme. In part because of the existence of this scheme, municipalities, provinces and water authorities are introducing measures across the board that contribute to the goals of the Delta Programme for Spatial Adaptation. As a result, interest in implementing climate-adaptive measures is growing and collaborative structures at the local and regional levels are being further strengthened. The Delta Programme for Spatial Adaptation will go to work from 2023 onwards to look at the possible options for the structural financing of climate adaptation (on several scales) after the end of the stimulus scheme.

New climate scenarios

The new KNMI Climate Scenarios will be published, followed by the new delta scenarios, in October 2023. They will be integrated in the Climate Impact Atlas and in the

leaflet for the stress tests of the Delta Programme for Spatial Adaptation. In this way, the new scenarios will be included in the cyclical approach of the Delta Programme for Spatial Adaptation.

Climate adaptation on the national scale

In 2023, Rijkswaterstaat is working with the policy departments of the Ministry of I&W to establish concrete policy objectives for the inclusion of climate adaptation in operational practices. Starting with the most urgent climate issues that the next government will have to address (such as the impact of prolonged water shortages and extreme precipitation), they will formulate them in terms of the contribution that I&W's networks can make in that respect. In 2024, they will continue to work up the associated measures and on the establishment of the basis required for the necessary investments. In 2022, Rijkswaterstaat also worked on the establishment of climate-resilient networks. For the main road network, the consequences of climate threats and the economic feasibility of measures have been mapped out using stress tests and risk dialogues. Rijkswaterstaat and the Ministry have drafted action perspectives that address puddle formation on major roads as a result of extreme rainfall, and the instability and erosion of road embankments. As far as the main waterway network is concerned, considerable attention is being paid to the impact of extreme weather on shipping, and the stability and functioning of engineering structures in extreme situations such as very low and very high water levels. Finally, five locations in the main water system are a focus of attention because of their vulnerability to climate extremes: the canals in Brabant, Amsterdam-Rhine Canal/



North Sea Canal, stretches of the Maas near the Dutch/Belgian border, the canals in Twente and the Ghent-Terneuzen Canal.

Climate-resilient vital infrastructure

The Delta Programme for Spatial Adaptation and the National Climate Adaptation Strategy (NAS) are working on climate-resilient vital infrastructure, with the central focus on what can be done in an area, with the infrastructure providers, to reduce the risk of major damage and long-term disruption. And to identify the steps that should be taken in the case of an emergency. The partners of the Delta Programme for Spatial Adaptation have taken the necessary steps in recent years with regard to the implementation of stress tests. The safety regions have conducted impact analyses. The partners in the areas are emphatically researching the impact of climate risks on vital and vulnerable functions in their areas. Nationwide, work is going into the strengthened ‘Tackling Vital Infrastructure’ programme. In addition, in part on the basis of new European regulations, a legal framework is being developed with the aim of enhancing the physical resilience of the vital infrastructure in the Netherlands. This means that a harmonised approach is being developed at the initiative of the national government. The elaboration of that approach will involve examining how the Delta Programme’s area-based approach, the available stress tests and other support can be combined to enhance resilience.

In the time ahead, work will take place on vital infrastructure involving the implementation of the recommendations of the Pluvial and River Flooding Policy Platform

with respect to standards for consequences in an area and the role of vital infrastructure. The outcomes will be available in 2024.

5.3 Connections

Housing deals

The inclusion of climate adaptation as an important boundary condition in the 35 regional housing deals is an excellent result. In those deals, the central government, provinces, municipalities and other stakeholders make agreements about the number of homes to be built in each region but also, for example, about the design of public spaces, the construction of roads and renewing residential areas. It is now up to the regions to formulate the agreements in more concrete terms in their plans and to actually work out climate adaptation in the plans and their implementation.

Green-blue networks

In spatial development, many measures for climate adaptation, the quality of the living environment, health, cultural heritage and biodiversity are well suited to being combined. By giving nature and water a prominent role in all construction plans (including those for housing), it is possible to establish a fine-meshed habitat of green-blue networks in the Netherlands. Furthermore, the Delta Programme for Spatial Adaptation is seeking to establish links with nature-inclusive construction and the biodiversity agenda. The National Yardstick for a green, climate-adaptive built environment is already

implementing these initiatives for new construction sites, but not yet for existing buildings.

5.4 Delta Plan for Spatial Adaptation

The Delta Plan for Spatial Adaptation includes seven ambitions that together constitute the approach for the gradual establishment of a climate-resilient and water-robust Netherlands by 2050. The next cycle will begin in 2024-2025.

1, 2 and 3: Stress tests, risk dialogues and implementation agendas

The first three phases have been completed in all 45 DPRA working regions and for the I&W networks. A new round is starting that involves supplementary stress tests, the deepening of risk dialogues, and adding to or overhauling the implementation agendas. This new round revolves around tailored approaches that require individual considerations about the desired focus for each working region and for each layer of government (including central government). The Delta Programme for Spatial Adaptation has initiated a process to arrive at more uniform principles for the stress tests that will be included in a revised ‘Standardised Stress Test Leaflet’.

4: Exploiting synergy opportunities

The ambition of the Delta Programme for Spatial Adaptation is that all spatial planning in the Netherlands should be climate-adaptive. The Delta Programme for Spatial Adaptation is making significant advances in terms of exploiting synergy opportunities in, among other things, spatial arrangements, housing



deals, the energy transition and the nitrogen deposition agenda. The Delta Programme is also actively seeking to establish connections with developments and investments in vital and vulnerable functions such as energy, health care and the chemical industry. However, the climate adaptation agenda is even broader than the themes in the Delta Programme for Spatial Adaptation. The Delta Programme seeks to establish that breadth primarily through the National Climate Adaptation Strategy.

5: Encourage and facilitate

The 45 DPRA working regions can apply for the temporary Climate Adaptation Stimulus Scheme until year-end 2023. Measures must be completed by 2027 at the latest. The Climate Adaptation Knowledge Portal is an important pillar for establishing access to knowledge. Government authorities, knowledge institutes and business work together in the portal to draw attention to the challenges facing society as a whole. Finally, the LIFE IP Climate Adaptation programme – which is co-funded by the EU – is working on the acceleration of climate adaptation by developing specifically relevant knowledge at the project level and actively disseminating it.

6: Regulation and embedding

The Delta Programme for Spatial Adaptation is involved in work on the statutory embedding of the National Yardstick for a green, climate-adaptive built environment and on the further elaboration of various planning decisions relevant for the programme from the parliamentary letter on Water and Soil as Leading Factors. The statutory embedding of the National Yardstick is now being

explored. In line with this initiative, and pending the legal procedures, a number of water authorities wish to embed the principles from the National Yardstick in their own regulations. For example, Hoogheemraadschap De Stichtse Rijnlanden has introduced a regulation for the collection of rainwater in its own area. The effect on regulations also applies to the work processes and measures taken by standardisation organisations: this is being coordinated by the Climate Adaptation Standards Consultation Platform (OSKA). In addition, the updated guideline is available for local regulations for climate-adaptive and nature-inclusive construction, planning and management. The DPRA community wants to move away from the non-committal approach to climate adaptation. For the Association of Netherlands Municipalities (VNG), however, a mandatory approach must be inextricably linked to strengthening the operational capacity of municipalities.

7: Emergencies

An adequate approach to emergencies continues to be crucial at all times. Safety regions are increasingly paying attention to the effects of climate change. For example, all the safety regions conducted an impact analysis in 2022. In broader terms, the security field, for example through the Nationwide Risk Analysis for National Security and the National Security Strategy, is focusing more on climate risks. More droughts in Europe have also brought the risk of wildfires into sharper focus. Climate risks like this also affect vital infrastructure. To an increasing extent, they require the providers of networks of this kind to identify the climate risks for their networks and formulate responses to make structures more resilient in order to

reduce outages and damage during emergencies. This area will be worked out in further detail as part of the nationwide ‘Tackling Vital Infrastructure’ programme. Adaptation measures for water availability and to manage flooding can, in addition to producing health benefits, also have undesirable side effects such as the spread of infectious diseases. For example, water collection or storage can improve or create habitats for mosquitoes. Green measures can have an impact on the spread of ticks. As part of the NAS, the Ministry of Health, Welfare and Sport is working on the theme of health and climate adaptation. In this context, the Ministry and the Delta Programme are exploring how the Delta Programme can prevent or limit the negative side effects of adaptation measures on health. Furthermore, a range of municipal health services are active participants in the LIFE-IP Climate Adaptation Programme. They can generate specific attention during times of heat stress with the aim of minimising the number of casualties, particularly among the elderly and people with poor health. More attention is needed for the theme of ‘heat’ and measures will become increasingly necessary. In this way, the Netherlands Enterprise Agency (RVO) developed a Hot Weather Action Plan to support the approach to hot weather by municipalities in collaboration with the relevant partners.



Chapter 6

Progress by area



Galgeplaat in the Eastern Scheldt (Zeeland), August 2021

IMPLEMENTATION IN THE AREAS

Regional emphases

Each area has a tailored approach for the agendas of the Delta Programme. The main areas of concern for each area are shown here.

The objectives for flood risk management would appear to be feasible everywhere; integration with other agendas requires attention. Freshwater availability is already under pressure in several areas due to both climate change and rising demand.

Coast

Combine major spatial agendas in the coastal zone with water agendas (including flood risk management) where possible

Central Holland

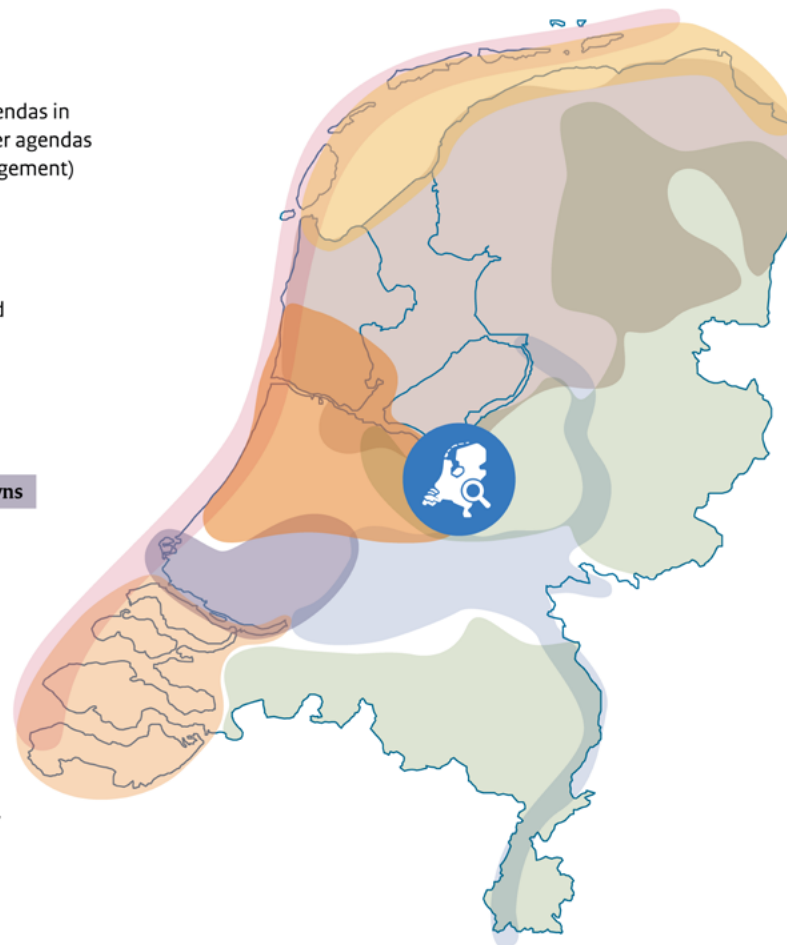
Ensure that we keep ahead of crises: we already have to take extra measures in wet conditions to keep the area dry

Rhine Estuary-Drecht Towns

Flood risk management is certainly safeguarded until 2070: prepare for decisions after that time

Southwest Delta

We are working on innovative solutions to improve freshwater and drinking-water availability in the *entire* region



Wadden area

Link objectives for the Wadden area to objectives for the hinterland

IJsselmeer area

Declining freshwater supplies, increasing demand: make administrative decisions and regional agreements

High-Lying Areas with Sandy Soils

Involve all water users on an equal footing in the establishment of resilience to water shortages

Rhine and Meuse

Be an ambassador for the river area: opt for a future-resilient river area in all spatial decisions

Water and Soil as Leading Factors

The policy letter for Water and Soil as Leading Factors provides direction for spatial developments and future-resilient measures for flood risk management and fresh water in all areas. Putting that direction into practice is still often problematic.

Coast

Anticipate the effects of sea level rise on the basis of insights from the Sea Level Rise Knowledge Programme

Central Holland

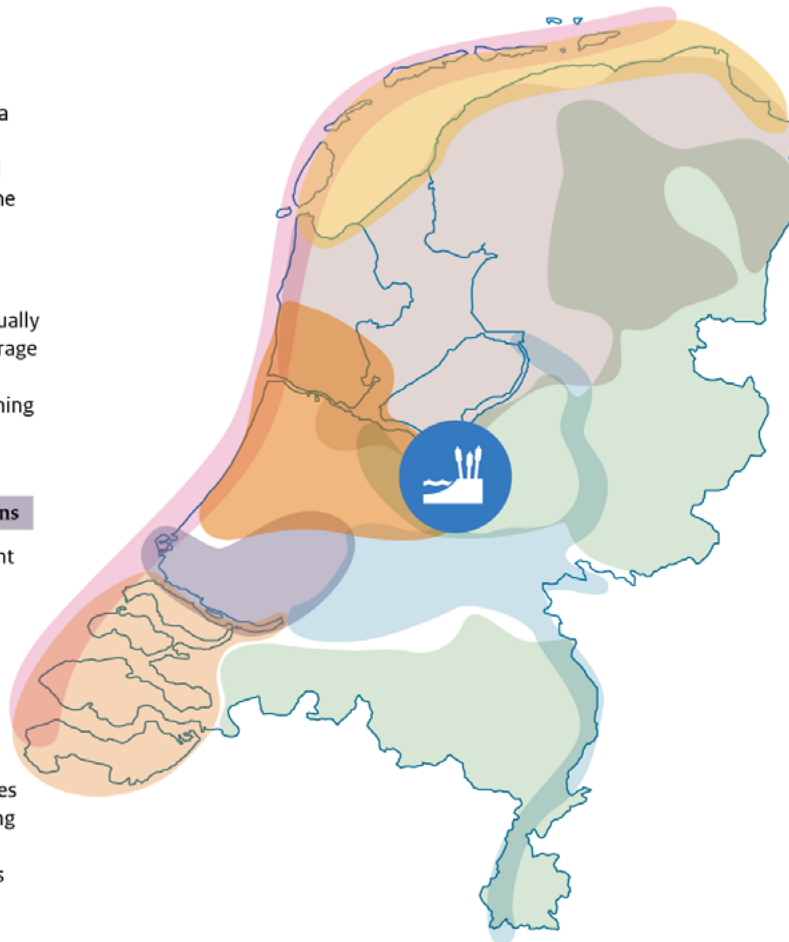
Allow water and soil to actually lead the way: have the courage to make difficult decisions and accept that not everything is possible everywhere

Rhine Estuary-Drecht Towns

Implement climate-resilient spatial developments: Water and Soil as Leading Factors!

Southwest Delta

The Southwest Delta connects the main principles of Water and Soil as Leading Factors, the National Programme for Rural Areas and the Area Agenda



Wadden area

Widen the perspective to extend beyond flood defences to an integrated coastal protection zone (inside and outside the dikes)

IJsselmeer area

Water levels are going to change, possibly even before 2050 in the case of the summer level: keep the options open

High-Lying Areas with Sandy Soils

Support Water and Soil as Leading Factors with national instruments in addition to regional instruments

Rhine and Meuse

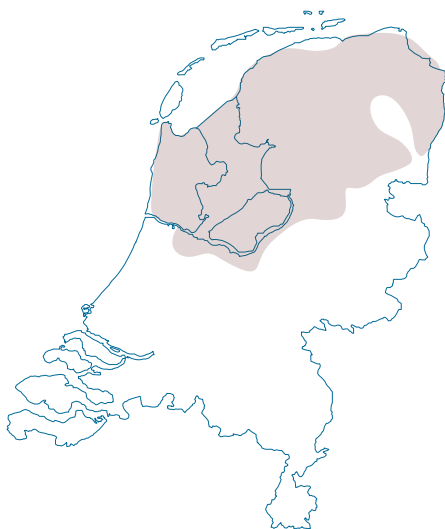
Allow water and soil to lead plan development

6.1 Introduction

The partners in the Delta Programme are working in distinct areas to implement the preferred strategy for the three agendas of the Delta Programme: flood risk management, fresh water and spatial adaptation. This chapter describes the progress that has been made. The acceleration of climate change means that the agendas facing the different areas can only become more daunting. To achieve the set targets by 2050, it will be necessary to pull out all the stops. The figure 'Implementation in the Areas – Water and Soil as Leading Factors' shows how the various authorities are going about this, which insights will result – including insights for after 2050 – and how they are already putting the principles of Water and Soil as Leading Factors into practice. In addition to the seven areas covered by the Delta Programme, progress in Central Holland is also described annually because of the importance of the links between this region and the Delta Programme.²⁴

²⁴ Pursuant to the provisions of the Water Act, the Delta Programme does not apply to the Caribbean Netherlands. This Delta Programme does not therefore describe progress in the Caribbean Netherlands on flood risk management, freshwater supplies or spatial adaptation.

6.2 IJsselmeer area



Declining freshwater supplies, increasing demand: make administrative decisions and regional agreements



Water levels are going to change, possibly even before 2050 in the case of the summer level: keep the options open



Limit salt intrusion through the locks: it threatens freshwater supplies

The Delta Programme helps to preserve the functions of the IJsselmeer area for the future and where possible to strengthen them. The main water system is inseparable from the regional systems. Collaboration is the key here. Freshwater supplies, dike upgrades, combating salinisation and increases in discharge capacity also affect the ecological quality of the system. The complexity of the agendas requires intensive cooperation and further knowledge development.²⁵

6.2.1 Perspective for 2050 and later

Flood risk management and discharge capacity

Storms, torrential rain and the amount of water coming in through the IJssel are the critical factors for flood risk management in the IJsselmeer area. The new pumps in the Afsluitdijk barrier dam at Den Oever will be completed no later than 2025. This means that flood risk management would seem to be adequately safeguarded until 2050. The regional integrated flood risk management perspective for the IJsselmeer area will be completed in 2024. It looks at the consequences of decisions relating to water level management in the main water system for the discharge statistics of the regional systems draining into the IJsselmeer area. This provides a picture of problems with excess water in the regions around the IJsselmeer area in the future (after 2050) and that is, in turn, important for drafting regional vision outlooks and planning investments with a long life cycle.

²⁵ See background document F Progress in areas for more information about progress made by the IJsselmeer Area Delta Programme in 2022.

The results will also be used to develop the preferred strategy that has to be completed at the time of the 2026 periodical evaluation.

Required buffer capacity

To safeguard freshwater availability and address shortages in the regions, it was decided in 2014 to draft a new water level decree. The new decree with a flexible summer level took effect in 2018, resulting in a significant increase in buffer capacity. The underlying idea was that this capacity would be adequate to cope with droughts occurring once every twenty years. In 2022, it was necessary to lower the level to just below the minimum of the bandwidth stated in the water level decree. Research in the Freshwater Delta Programme (2020) shows that the current buffer capacity will fall short more than once every twenty years in the near future. After 2050, those shortfalls will already occur more than once every five years. Shortages in the regions result in land subsidence and damage to agriculture and nature.

Increased water demand

Research shows that water demand is increasing. This is due to the increased need for flushing to combat salinisation, higher demand for drinking water, more evaporation, additional water demand from peatland areas to combat carbon emissions and land subsidence, and developments such as hydrogen plants. In addition, climate scenarios indicate that river discharges will be lower during the summer. A stress test in 2024 based on new climate scenarios is expected to provide a picture of the extent of the challenge given the current ambition for a maximum of a water shortage in the IJsselmeer area



once every twenty years. Potential measures that can help to achieve that ambition are being investigated for the periodical evaluation of the preferred strategy for the IJsselmeer area. These include measures such as reducing water demand, combating salinisation at the locks in the Afsluitdijk barrier, additional water input from the main water system and increasing the size of the freshwater buffer. The final periodical evaluation will seek to establish the optimal mix for measures of this kind. All the values and functions of the IJsselmeer area are taken into consideration.

6.2.2 Developments

KNMI Climate Scenarios

The new KNMI Climate Scenarios are crucial for the IJsselmeer area. That is because the knock-on effects of those scenarios on sea level rise, water supplies, evaporation, torrential rain and storms can have a significant impact on the measures to be taken. Sea level rise limits discharge capacity and affects salinisation, water level management and measures for flood risk management. This requires striking a sound balance between lake levels, dike upgrades and pumping capacity.

Salinisation

Salinisation is seen in the IJsselmeer because of the opening and closing of discharge sluices and locks. Salt water from the Wadden Sea enters the IJsselmeer via the shipping lanes. This is already having an impact on drinking water supplies, nature and agriculture. The effect is significantly larger in the summer, when flushing is limited, than in the winter.

Developments in supply and demand

In the regions, a shift can be seen from the extraction of drinking water from groundwater to extraction from surface water in the IJsselmeer and the Randmeren peripheral lakes. Drinking water companies are looking for suitable intake points in the IJsselmeer, Gooi and Eemmeer lakes, with an increase in water demand as a result. The drinking water company PWN is working on the development of a climate buffer to reduce its water requirements temporarily during dry periods and therefore contributing to the robustness of the system.

The distribution of water from the Rhine across the Netherlands is also important. That is because the amount of water supplied through the IJssel during wet and dry periods has a major influence on the replenishment of the buffer and flood risk management in the IJsselmeer area.

Integrated approach to area agendas

Pressure on space in our country is resulting in a greater need for spatial interventions in the IJsselmeer area. In addition to housing and industry, these include the construction of leisure facilities, nature conservation and development, more shipping, mineral extraction, compensation agendas for nature, and room for the production of sustainable energy. Spatial interventions in and along the lakes may get in the way of dike upgrades in the future, affect buffer capacity and push up water demand. Conversely, other lake levels and measures targeting flood risk management in the IJsselmeer area may affect landscape and cultural-historical quality, as well as the available options for spatial interventions.

6.2.3 Connections

Spatial puzzle with land and water

The IJsselmeer area extends far beyond the lakes, encompassing almost half of the Netherlands. The national, regional and local agendas have an impact to a greater or lesser extent on the current or future functionality of the IJsselmeer. The spatial puzzle involving demand for housing, energy, drinking water and healthy food is a factor in all the provinces in the IJsselmeer area. All these aspects have an impact on water demand, flood risk management and the ecological quality of the IJsselmeer area.

Climate-resilient and water-robust by 2050

The IJsselmeer area is working hard in a range of alliances on achieving the goal 'Climate-resilient and water-robust by 2050'. In this context, the principle of Water and Soil as Leading Factors sets out new frameworks that parties will have to work with. This requires a reconsideration of spatial plans, including those for building outside the dikes in the IJsselmeer area. Measures to improve water quality and the ecosystem, and knowledge development in these areas, are necessary. There is a joint challenge to design measures in the Programmatic Approach for the Main Water System (PAGW) in such a way that they will deplete storage capacity as little as possible but will contribute to the ecological agenda for the IJsselmeer area.

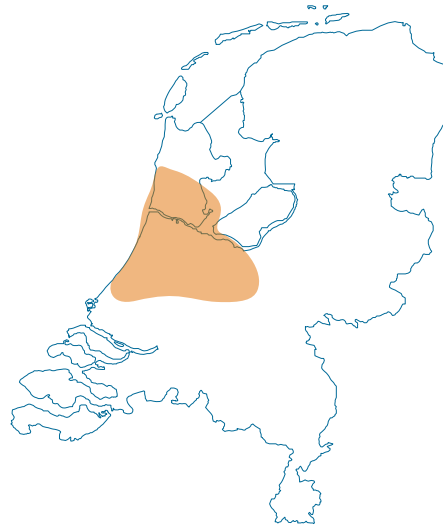
Open dialogue

Water demand is also closely related to site selection for spatial developments. Industrial activities on the coast and at the extremities of the periphery of the incoming



water supply discharge process water (cooling water) into the sea, which means it is not returned to the system. But the fact that they are located on the coast also makes it possible to use salt water as process water. Furthermore, locations for housing development or capital-intensive agriculture may affect freshwater demand from the IJsselmeer. The Provincial Programme for Rural Areas (PPLG) is an instrument for linking agendas such as nitrogen deposition, water quality and climate adaptation. The IJsselmeer Area Delta Plan is seeking synergy opportunities for the different agendas and the funds from which the measures are financed. The spatial reconnaissance study that is being conducted in 2023 is intended to result in an assessment framework to determine the optimal balance between the main functions of the Blue Heart and its economic and landscape value in an open dialogue.

6.3 Central Holland



Ensure that we keep ahead of crises: we already have to take extra measures in wet conditions to keep the area dry



Allow water and soil to actually lead the way: have the courage to make difficult decisions and accept that not everything is possible everywhere



Work with a clear strategy and a climate-resilient future for Central Holland's four million inhabitants

Central Holland is located between the IJsselmeer area, the coast and the river area, and it includes the metropolitan regions of Utrecht and Amsterdam and the Green Heart. From the river area, the Amsterdam-Rhine Canal runs through Central Holland into the North Sea Canal. The locks, and the pumping and discharge complex, in IJmuiden connect the canal to the North Sea. Central Holland is home to nearly a quarter of the Dutch population, it makes a crucial contribution to the economy day and night, and it is undergoing a makeover for a large number of national and regional building and development agendas. At the same time, the area is very vulnerable. The sea level is rising and the land is subsiding. The limits of the water system have been reached. The area is already very vulnerable to problems with excess water and water shortages. The size, complexity and coordination of the agendas in the area require a broad-based societal assessment.

In 2023, Central Holland is completing the process of being represented as an area in the Delta Programme. In order to combine the agendas for flood risk management, fresh water and spatial adaptation, to address them in collaboration with the spatial-planning sector and ensure they guide spatial development, Central Holland needs effective representation in the Delta Programme.

6.3.1 Perspective for 2050 and later

Every day, four million people want to live and work safely in Central Holland and they look forward to continuing to do so in the future. Even in the short term, large-scale developments are planned in the NOVEX processes in the area. Housing construction around the metropolitan regions of Amsterdam and Utrecht, a reorientation of the port of Amsterdam, increasing economic activity, the



energy transition (including the emergence of hydrogen hubs), the establishment of drinking water sources and the raising of the water level in peatland areas in the Green Heart are just a few examples of, often conflicting, space and water demands in Central Holland.

The water system, from the canals to the water in the polders, underlies all the functions in the area. Management authorities are pushing at the limits of the current water system with ‘smart water management’ and technical interventions, as well as by collaborating closely on operational water management when conditions are extreme. However, Central Holland’s current water system and spatial planning are not robust enough to absorb the effects of climate change in combination with major societal challenges. This is already leading to a significant risk of flooding and actual damage during water shortages in Central Holland.

Effect of water system in spatial domain

Solutions for a future-resilient – robust, adaptive and transformative – Central Holland transcend the water system. The current strategy of close collaboration and technical interventions is crucial for the short term but not tenable for long-term water management and spatial development in Central Holland.

Users and decision-makers in the area are not familiar enough with the dependencies and risks of the water system. The agenda is too large and water awareness is too low. There also needs to be a growing awareness that not everything can be done everywhere. Water agendas and water availability should serve as the boundary preconditions for developments. Where can housing be

built? How can construction be made climate-resilient? Which water storage arrangements, drainage capacity and safety standards are needed to protect the area?

Decisions that are made now will establish the basis for Central Holland in 2050 and beyond. This area requires a strategy and an appropriate governance structure that brings together spatial developments and water agendas at different scales and connects Central Holland with surrounding areas and preferred strategies.

6.3.2 Developments

Limits of water system reached

Central Holland is highly susceptible to flooding. To keep its feet dry, the area depends almost entirely on one drainage point: the IJmuiden pumping and discharge complex on the North Sea coast. In the current situation, the maximum amount of water to be discharged from the region and the hinterland exceeds the capacity of the IJmuiden pumping station. In normal circumstances, it has emerged that the dependence on discharge to maintain water levels within the margins is already high. Every year, the discharge potential is falling. This effect will be exacerbated in the years ahead because of rising sea levels. If the level of the canal rises from -0.40 m NAP (target level) to 0.00 m NAP, polders throughout Central Holland will be flooded. The probability of this happening is estimated to be more than once in every hundred years. Extreme precipitation will increase but the area cannot handle large amounts of rainfall of the magnitude seen in Limburg in the summer of 2021. Such amounts could lead to sewage water entering the streets

of Amsterdam. It could then take more than a week to drain water from the area. A national stress test conducted by Rijkswaterstaat in 2019 found that the IJmuiden drainage complex is the structure that is most vulnerable to the effects of climate.

Shortages of fresh water will also result quickly in problems in Central Holland. In times of drought, there is not enough water for all user functions. A freshwater shortage in 2022, for example, caused ecological damage, as well as severe restrictions on, and economic damage for, commercial and recreational shipping on the North Sea Canal, Amsterdam-Rhine Canal, on side canals and adjacent waters. Situations in which salt concentrations are high will, in all probability, become more frequent, not only because of increasing water shortages and lower river discharges but also because of shipping passing through locks. Moreover, demand for fresh water is likely to increase further. These examples illustrate the need for society to make decisions about user functions that require fresh water, operational water management and the water infrastructure.

Future-resilient water system in the Amsterdam-Rhine Canal/North Sea Canal Area

The programme for the Future-Resilient Water System in the Amsterdam-Rhine Canal/North Sea Canal Area (ARK/NZK) is investigating bottlenecks and possible solutions for problems with excess water and water shortages, salinisation and spatial impact in Central Holland between now and 2100. The programme actively raises areas for consideration, and opportunities, in the course of ongoing area processes such as NOVEX.



It is looking at the utility, necessity, technical feasibility and costs of the construction of a new pumping station that could discharge excess water to the Markermeer lake or Lek/Waal rivers to compensate for the decline in discharge potential at IJmuiden. This additional drainage option will also help to protect the area better from flooding. The Climate-Resilient Freshwater Supplies in the Main Water System (KZH) programme is investigating whether a new pumping station could also bring water from the Amsterdam-Rhine Canal to the IJsselmeer area in order to prepare for impending water shortages. Developments in both incoming and outgoing water flows require supra-regional coordination.

Sea Level Rise Knowledge Programme

Area workshops in the Sea Level Rise Knowledge Programme are exploring adaptation strategies that anticipate further sea level rise after 2050. Sea level rise will result in spatial challenges throughout the area. The workshops make it clear that choices made now will have implications extending far into the future. The transition challenges in Central Holland already require rapid and capital-intensive interventions. To prevent disinvestment and in order to avoid closing off adaptation pathways prematurely, the Sea Level Rise Knowledge Programme must provide guidance soon. In that way, the long-term perspective can provide concrete input for spatial planning choices.

6.3.3 Connections

Water and Soil as Leading Factors

The principle of Water and Soil as Leading Factors must structure all the developments and transitions required in the area and go hand in hand with local and regional climate adaptation measures and decisions in the Provincial Programmes for Rural Areas (PPLGs) and NOVEX. Genuine guidance requires choosing between user functions and the concrete formulation of the principles of Water and Soil as Leading Factors in regulations. Via the administrative message from the water system, the principles of Water and Soil as Leading Factors should be heard in spatial plans for future- and climate-resilient planning.

Supra-regional coordination and orchestration

Action must also be orchestrated beyond the borders of Central Holland, in conjunction with other areas and processes such as the Sea Level Rise Knowledge Programme, the Freshwater and IJsselmeer Area Delta Programmes and Integrated River Management (IRM). Decisions in national processes such as the Climate-Resilient Freshwater Supplies in the Main Water System (KZH) programme must be made in conjunction with the development of Central Holland: many functions in the area depend on the availability of adequate supplies of fresh water and the possibility of drainage.

The Central Holland area is bringing together the building blocks from all processes and sub-programmes in order to prepare for joint decisions from the perspective of water and space that do justice to the area's current value and future development.

6.4 Rivers



Allow water and soil to lead plan development



Be an ambassador for the river area: opt for a future-resilient river area in all spatial decisions



Collaboration is needed: assume responsibility and act together as a single government

The first periodical evaluation of the preferred strategy for the Rhine and Meuse is being conducted through the Integrated River Management (IRM) programme. The goal is to establish a future-resilient river basin that works well as a system and that can be used for multiple functions. This requires striking a good balance between the different functions of the area: flood risk management, nature and water quality, navigability, freshwater availability and regional economic development. IRM will be defined in a Programme under the Environment Act (POW-IRM) that will set out the vision for the area, make policy choices about future discharge capacity and riverbed location, and establish collaborative agreements. The POW-IRM will also identify the areas for the initial area-specific approaches and further studies. All this will result in an adaptive programme with a range of interventions, studies and processes between now and 2050, looking ahead to 2100.

The POW-IRM is expected to be available for inspection in early 2024, after which definitive decisions can be made. In parallel, IRM is working on an IRM Implementation Programme for the concrete implementation of measures in the POW-IRM.

6.4.1 Perspective for 2050 and later

Riverbed location

Particularly in the area enclosed by the Rhine distributaries and the Border Meuse to the east of Nijmegen (the splitsingspuntengebied), the river bed has been increasingly eroded. This has negative effects on nature, freshwater supplies, flood risk management and

shipping. IRM is committed to preventing further deterioration in the years ahead. The aim between now and 2050 is to raise specific stretches of the riverbed. This will require combining a range of interventions such as stopping the removal of sediment from the summer bed, replenishing sediment and the reduction of the flow velocity by widening the river. IRM launched two pilot projects for replenishing sediment in the Middle Waal and Border Meuse in 2022.

Multiple use of space

Because of the multiplicity of wishes and ambitions for the river area, enough space must be kept available for the various agendas. At the same time, choices have to be made and a commitment is needed to using space in multiple ways. This requires an integrated approach and measures that are not isolated but part of a logical and coordinated whole. A future-resilient river system can be established only on the basis of integrated assessments and collaboration. The POW-IRM provides concrete suggestions for this purpose.

Along the Meuse and Rhine, plans are being elaborated for a number of integrated projects, such as the Meandering Meuse and the River Climate Park. In the context of the IRM, fifteen projects (including pilot projects) have also been added. The pilot projects include, for example, the areas around Fort St. Andries, Rheden and Maastricht. In 2023, the third tranche budget from the Programmatic Approach for the Main Water System (PAGW) became available for IJssel-Vecht Delta, Gelderse Poort and Vierwaarden. The aim is to implement an integrated approach in these projects.

IRM is looking at how other spatial interventions such as river widening can contribute to the flood risk management agenda before and after 2050. River widening opens up options for limiting water levels during peak discharges due to climate change before and after 2050. It also provides options for implementing agendas arising from nature, freshwater availability and shipping.

It is important to earmark space in the riverbed in the Limburg Meuse valley for the purposes of flood risk management along the entire Meuse. A study of the effectiveness of the systemic measures in the Meuse Valley was launched for this purpose in 2023. Another focus of attention is the connection between the regional and main system, between downstream and upstream. This also fits in with the recommendations of the Pluvial and River Flooding Policy Platform.

Research will begin for the Rhine distributaries into the desired high-water distribution after 2050 once the KNMI 2023 Climate Scenarios are available. The results will provide input for area development and projects in the area.

Freshwater availability

As a result of climate change, there are increasingly frequent (and often long) periods of drought. For the main water system, the ambition is to establish a resilient system to cope with water scarcity. This also applies to the river area as an important source of drinking water (Meuse), and the incoming flow of water towards the IJsselmeer, Eastern Netherlands (Twente canals) and North Brabant (Brabant canals). A specific focus of IRM is the low-water distribution in the Gelderse Poort between the Waal, Nederrijn-Lek and IJssel. Due to the uneven erosion

of these river distributaries, more water now flows towards the Waal, endangering the navigability of the IJssel and the supply of fresh water to the IJsselmeer. The POW-IRM aims to correct the position of the bed and therefore the low-water distribution.

6.4.2 Developments

Synergy with other agendas

In recent years, there have been good experiences in the Rhine and Meuse Delta Programmes with respect to tackling the flood risk management agenda in conjunction with, for example, nature agendas in these areas. This includes, among other things, agendas based on the Water Framework Directive (WFD) and the Programmatic Approach for the Main Water System (PAGW). They involve not only the smart use of scarce space (in other words, the multiple use of space) but also combining resources and locality communications in smart ways. In the POW-IRM, the major challenge mainly involves the standardisation and harmonisation of the process requirements, which currently vary considerably between the various sectoral programmes, resulting in a considerable administrative burden on the road to achieving integrated area development. This challenge is taking shape in the integrated approach proposed in the POW-IRM.

Collaboration

The design of the river area requires close cooperation between government authorities, interest groups, residents, users and landowners. In line with the new Environment Act, government authorities are being asked to act as one. At the

same time, everyone has their own role and responsibilities for area development. This requires sound agreements about governance and financing. The adequate joint structuring of decision-making processes is essential but also challenging. This is also due to the limited amount of physical space. Intelligent decisions require not only close collaboration and orchestration but also a unified approach to communications: each of the partners is an ambassador for the river area and for the decisions to be made for a future-resilient river area. Within the framework of IRM, those involved agree on the best way to shape collaboration in the river area in the years ahead.

Pluvial and River Flooding Policy Platform

In its final advisory report, the Pluvial and River Flooding Policy Platform notes that extreme precipitation, as in the summer of 2021 in Limburg, will become more frequent and possibly even more extreme due to climate change. Proper preparations are needed to prevent social disruption. The policy platform makes a range of recommendations in the areas of prevention, impact mitigation, crisis management, water awareness and recovery. The final advisory report supports an integrated approach to river widening and dike upgrades. It also points out the need to consider the main water system and the regional water system in conjunction. This area is being studied and developed further in, for example, the IRM pilot study on Flood Risk Management in 's-Hertogenbosch. At this location, the potential confluence of peak discharges from the Meuse, sea level rise and higher regional discharges from the Dommel and Aa rivers involves risks for the future that require adequate measures.



6.4.3 Connections

Water and Soil as Leading Factors

The parliamentary letter on Water and Soil as Leading Factors is the catalyst for the IRM philosophy. In the river area, this includes creating space for water, limiting building in the winter bed and earmarking areas inside the dikes, updating earmarked areas around flood defences and looking for space for natural inland shores.²⁶ The concrete details developed by the regional stakeholders will make clear the practical effect of these planning decisions.

Flood Risk Management Programme (HWBP)

The combination of dike upgrades based on the Flood Protection Programme (HWBP) and floodplain planning provides opportunities to address spatial planning together, for example in the areas of communications and soil flows. The partners working together in the Heritage Deal are seizing the opportunity afforded by the dike upgrade operation between Gorinchem and Waardenburg to tell the story of the Dutch Water Line (which is listed as UNESCO World Heritage), and to give former inundation areas a climate-adaptive function.

National Programme for Rural Areas (NPLG)

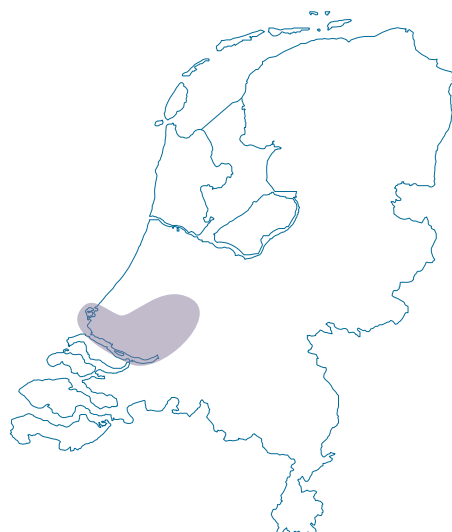
A future-resilient river system is linked to the transformation of rural areas. Dikes, as vertical elevations in the landscape, constitute strange boundaries in spatial planning. Thinking beyond dikes makes relationships between different agendas clearer. It results in, among other things, an understanding of the functional relationships between factors such as low water, groundwater and agriculture. Future river management will require more space to accommodate extreme discharges, nature development and water buffering in the context of a more extreme climate. IRM parties raised the question of the need for this space with the provincial authorities that are drafting their Provincial Rural Area Programmes (PPLGs) and Spatial Arrangements. IRM, as a programme implementing the principles of Water and Soil as Leading Factors, provides tools for designing the Spatial Arrangements in a future-resilient way.

Programmatic Approach for the Main Water System (PAGW)

For the river area, the PAGW drew up an ecological system agenda. The goal is high-quality nature that goes well with a strong economy. This requires a sufficiently robust and future-resilient river area with an interconnected network of large and small natural areas. The restoration of natural river dynamics is an important pre-condition for establishing adequate nature quality in these areas. The PAGW agenda is an integrated part of the POW-IRM.

²⁶ An 'inland shore' is a water storage area inside a dike where the water level can fluctuate considerably. This allows specific areas to store water from rivers when there is excess water and, conversely, to make water available during periods when there is a shortage of water.

6.5 Rhine Estuary-Drecht Towns



Flood risk management is certainly safeguarded until 2070: prepare for decisions after that time



Continue to engage with representatives of society about the long-term options



Tell people what is around the corner for the region and give future generations room to choose



Implement climate-resilient spatial developments: Water and Soil as Leading Factors!

The stakeholders in the Rhine Estuary-Drecht Towns area want to ensure that the approach to spatial agendas overlaps with measures for flood risk management and climate resilience in the region. In all the investments, these synergies are taken into consideration because area developments are for the long term, and efficient linkage with the agenda for flood risk management is not only safer but also potentially cost-effective.²⁷

6.5.1 Perspective for 2050 and later

Flood risk management

Protection from flooding in the Rhine Estuary-Drecht Towns will be safeguarded until well after 2050 by the system of dikes and storm surge barriers. The sound maintenance of storm surge barriers and dike upgrades in accordance with the Flood Protection Programme (HWBP) is essential to maintain the closable open strategy ('protect open') until after 2070. For the long term, future scenarios are being developed in Track 4 of the Sea Level Rise Knowledge Programme that will visualise the demand for space as accurately as possible. These scenarios provide information about the desirability, or lack of desirability, of short-term spatial investments in the various areas. In addition, the Rhine Estuary-Drecht Towns Delta Programme is working on layers 2 and 3 of multi-layer safety with, among other things, spatial adaptation strategies for the dike zones and areas outside the dikes, and the development of plans for crisis management.

²⁷ See background document F Progress in areas for more information on the progress of the Rhine Estuary-Drecht Towns Delta Programme in 2022 (in Dutch).

Fresh water

The objective of the Freshwater Delta Decision is to make the Netherlands resilient to freshwater shortages. To this end, the Western Netherlands freshwater region formulated a strategy and package of measures with three pillars:

- The optimisation of the freshwater supply from the large rivers, including during periods when river discharges are low. For example, the establishment of a supply route through the Krimpenerwaard and improvements to the Kromme Rijn inlet.
- Innovative solutions such as using the subsurface and reusing effluent. Examples include brackish water extraction in the dunes. In this way, Dunea is establishing an additional source for drinking water production and enlarging the freshwater stocks below the dunes.
- Increasing the robustness of the regional system by means of, for instance, economical use, smarter flushing, buffers in the subsurface and flexible water levels. Nature management authorities are exploring the use of climate buffers. Drinking water companies are working to diversify sources. And in spatial planning, the national government, provinces and municipalities are taking water availability into consideration more.

Spatial adaptation

The principle of Water and Soil as Leading Factors is becoming more important for spatial adaptation. All government authorities will have to look beyond 2050 to manage both the new-building agenda and initiatives in existing built-up areas. Extra attention will have to be paid in particular to the feasibility of building outside the dikes



(and investments in construction there) and older low-lying residential areas in Zuid-Holland. It is important to look beyond the outcome of the current stress tests in the case of problems with excess water. The extreme floods in Limburg in July 2021 were a reason to look at heavier rainfall in a larger area as well. The supra-regional stress test conducted for Zuid-Holland shows where damage and problems with excess water as a result of a 'Limburg cloudburst' are unavoidable. This stress test results in suggestions about where the provincial authority, working with municipalities, water authorities and safety regions, can prepare for relief operations and recovery from extreme events of this kind.

6.5.2 Developments

Flood risk management

The most important development for the Rhine Estuary-Drecht Towns region is the expected sea level rise. Land subsidence and changes in river discharges also play a role for some areas. Furthermore, there is a major housing shortage in the Rhine Estuary-Drecht Towns region. The challenge here is to respond in a climate-adaptive way. Moreover, the urgent demand for new housing is putting more pressure on space, and therefore resulting in more claims on space. This has an effect on the space available for flood risk management. The Rhine Estuary-Drecht Towns Delta Programme is actively committed to establishing the appropriate structures and boundary conditions for area developments. That includes establishing a development framework for dikes. The parliamentary letter on Water and Soil as Leading Factors provides direction and

guidance for engaging with partners in the area of spatial planning.

Fresh water

The Western Netherlands freshwater region is keeping in mind a possible increase in water demand due to factors including population growth and land subsidence measures. This requires additional efforts to enhance the resilience of the regional system. The parliamentary letter on Water and Soil as Leading Factors and the National Programme for Rural Areas (NPLG) provide an additional stimulus to work on resilience to freshwater shortages through the spatial domain and area processes. In the area-specific approaches for the NPLG, the provincial authorities are including not only the knowledge from the bottleneck analysis but also the strategy and package of measures of the Western Netherlands freshwater region.

Spatial adaptation

The spatial challenge in Zuid-Holland is daunting. There are major ambitions for housing, work, accessibility, economic growth, nature, prosperity, health and liveability. At the same time, the limits to the coping capacity of the water and soil system are coming into view. The changing climate is fuelling debate about all these areas. The availability of drinking water, the water storage capacity needed to cope with problems with excess water and, in time, sea level rise mean that responsible decisions are indispensable. Administrative decisions about housing, the economy and accessibility will lead – unless additional efforts are made to strengthen the soil, water and ecological system – almost by definition to a decline in the

quality and future-resilience of prosperity and living conditions in Zuid-Holland.

The province of Zuid-Holland and the water authorities have drafted a joint 'Climate Cartography Set for Spatial Plans', a set of maps that, drawing on the latest knowledge, provides an insight into the suitability of spatial functions in relation to the characteristics of the water and soil system. Some parts of Zuid-Holland are, because of the current or changing conditions, suitable for certain functions to a greater or lesser degree, or they will need adaptations in order to remain future-resilient. The province and the water authorities are continuing to develop the Climate Cartography Set on the basis of discussions with municipalities and other stakeholders about the urbanisation agenda, the spatial-planning puzzle and the NPLG.

6.5.3 Connections

Flood risk management

Given the need for insight into how action is being coordinated, it has been decided to adopt a more active approach to establishing connections with the other themes of the Delta Programme (Fresh Water and Spatial Adaptation) and with external developments such as housing construction, the energy transition, land subsidence and nature development. The Rhine Estuary-Drecht Towns Delta Programme is conducting both official and administrative discussions with the representatives involved about the overlaps and synergy opportunities, for example with respect to fresh water and housing construction in relation to flood risk management.



Fresh water

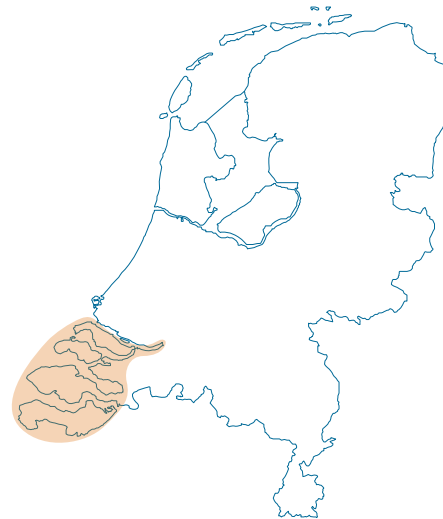
The Western Netherlands Freshwater Region is establishing active connections with other programmes that may affect water availability, such as the elaboration of the Climate-Resilient Freshwater Supplies in the Main Water System (KZH) programme, the implementation of the decision to open the Haringvliet locks involving learning from experience, the elaboration of the Water and Soil as Leading Factors principle, the developments relating to the NPLG and the results of the Groundwater and Pluvial Flooding Study Group. The discussions at both the official and administrative levels have contributed to knowledge exchange and the formulation of opinions.

Knowledge is also being developed about the availability of water in the context of the Sea Level Rise Knowledge Programme. The Western Netherlands Freshwater Region is participating, for example, in the area-specific approaches for the Rhine Estuary-Drecht Towns and Central Holland. The freshwater region's knowledge relating to water availability and salinisation has been used to provide input at the provincial level for the NPLG and for the initial elaboration of the Water and Soil as Leading Factors principle in the Climate Cartography Set developed for spatial planning.

Spatial adaptation

With the Climate Cartography Set for spatial planning, the provincial and water authorities in Zuid-Holland are establishing connections between spatial adaptation, flood risk management and the freshwater agendas. This process is part of the provincial area-specific approaches in the NPLG, the construction agenda and a range of spatial/economic considerations.

6.6 Southwest Delta



We are working on innovative solutions to improve freshwater and drinking-water availability in the entire region



The Southwest Delta connects the main principles of Water and Soil as Leading Factors, the National Programme for Rural Areas and the Area Agenda



Keep in mind the coordination between the Rhine and Meuse, Rhine Estuary-Drecht Towns and Southwest Delta sub-programmes as part of the Rhine-Meuse-Scheldt Delta



Some 25% of our primary flood defences do not comply with the standard: we are working on innovative solutions for an effective approach

The Southwest Delta has a number of complex agendas in the areas of flood risk management, fresh water, nature and spatial planning. The partners in the Southwest Delta are working in the Southwest Delta Area Consultation Platform on the ambition of being the first region in the world to have conducted a comprehensive appraisal, elaboration and initiation of the action needed to be climate-resilient by 2050. Over the next five to ten years, working towards future decisions and scaling up local pilot projects to the area level will be important, not only to achieve the overall goal and ambition for the area but also to continue responding to new regional and national agendas.²⁸

6.6.1 Perspective for 2050 and later

The implementation of the current preferred strategy is proceeding as planned. The reconnaissance study 'Water tussen wal en Schelde' and the implementation of the Hansweert dike upgrade over a distance of 5.2 kilometres began in 2022. In the Schouwen-Duiveland Living Lab and the Zeeland Freshwater Living Lab, a range of small-scale freshwater pilot projects are delivering knowledge and experience that can be applied and possibly scaled up in other areas of the Southwest Delta. Here, the Southwest Delta Area Consultation Platform is responding to new regional and governmental agendas such as Water and Soil as Leading Factors and the National Programme for Rural Areas (NPLG). In this way, the consultation platform is working adaptively on long-term perspectives.

²⁸ See background document F: Progress in areas for more information on the progress of the Delta Programme for the Southwest Delta in 2022 (in Dutch).

Southwest Delta Area Agenda for 2050

In the Southwest Delta Area Agenda for 2050, the Area Consultation Platform is focusing on the strategic link between addressing the problems of today and the challenges of the future. It is therefore encouraging a joint, innovative, area-based approach from network and alliance partners. The Area Agenda is intended to be a call to action: professionals, residents, administrators, entrepreneurs and knowledge institutes will work together to address the issues of the future in this delta area.

Elaboration of the Area Agenda

The partners in the climate-resilient Southwest Delta have adopted a triple-jump approach. In the ‘hop’ between now and 2030, the partners will build up knowledge and imagine their possible futures. This helps to make the decisions required that will be carried over to the ‘skip’, the period between 2030 and 2050, and the ‘jump’, the period after 2050. A sediment strategy has therefore been developed for the Eastern Scheldt to maintain the sandbanks as foraging habitat for birds. Knowledge accumulated during this process about the life cycle and feasibility of this type of nourishment can be used as a ‘hop’ for the ongoing development of the replenishment strategy in the ‘skip’ and the ‘jump’.

For the elaboration of the Area Agenda, the Area Consultation Platform is focusing on the various sub-areas. In doing so, it links up with the current programmes, area processes and developments. In addition to the ongoing processes for the Veerse Meer Area Vision and the Volkerak-Zoommeer Area Process,

area processes for the Eastern Scheldt and Western Scheldt will begin in 2023. In this way, the Area Agenda establishes connections between the current spatial issues in the area – the ‘hop’ – and the ‘jump’: the climate agendas after 2050.

6.6.2 Developments

In 2023, the Southwest Delta is focusing on the elaboration of the action perspectives from the Area Agenda. Here, partners are drawing on knowledge previously developed in the region about, and linked to, existing challenges in area concepts, for example in the preliminary studies Improving Water Quality in the Veerse Meer, and Fish and Birds, in the Programmatic Approach for the Main Water System (PAGW). A possible PAGW pilot project in the Welzinge and Schorer Polder (in the Western Scheldt area) will focus on strengthening cooperation between stakeholders and government authorities in order to develop integrated area concepts. This involves Water and Soil as Leading Factors and the National Programme for Rural Areas (NPLG) working simultaneously on robust, resilient delta nature, climate-resilient flood risk management and sustainable agriculture.

Sea level rise

The Sea Level Rise Knowledge Programme organised three working sessions for the Southwest Delta in 2022. They produced more insights into claims on future land and water land use, such as the construction of nuclear power plants and new coastal landscape development combining flood risk management, nature and leisure.

Flood risk management

On the basis of the latest statutory assessment, some 25% of the primary flood defences in the Southwest Delta do not meet the safety standard. This means there is a new and additional challenge for 2050 in the context of the Flood Protection Programme (HWBP). Given the increasing focus on flood risk management and climate change, the Area Consultation platform is seeking innovations in solutions for flood risk management in collaboration with interest groups, municipalities, citizens and entrepreneurs. A good example is the dike upgrade at Hansweert by the Scheldestromen water authority. That dike is sandwiched in the village between the built-up area of Hansweert and a business located outside the dike. Residents were involved in discussions about a range of variants and they contributed wishes and ideas during residents’ evenings and dike excursions. Work began in late 2022. It will be carried out in phases and completion is expected in 2027.

Expected change in preferred strategy

Given the available studies and developments, the preferred strategy for the Southwest Delta is expected to change in several ways. The ‘nature and water quality’ tipping points will be earlier than expected, for example in level-regulated systems such as the Veerse Meer and Grevelingenmeer lakes. Sandbanks, mudflats and salt marshes in the Eastern Scheldt will also be submerged sooner as sea level rise increases. The PAGW policy of replenishment to maintain habitats will remain effective until the rate of sea level rise reaches 10 mm/year (the rate is currently 2-3 mm/year). At that time, a complete review of the overall protection strategy for the Eastern Scheldt is



likely to be required. Ongoing research includes establishing a clearer picture in this respect. Because the Volkerak-Zoommeer lake will remain fresh, a new perspective for the future is needed. The area process should produce that perspective in 2024-2025. The area approach of the NPLG opens up opportunities for embedding it in integrated, innovative area development that will strengthen estuarine nature in the transition zone between the fresh river and the salty North Sea water, make agriculture more sustainable and, in terms of long-term flood risk management, be more in line with Water and Soil as Leading Factors and Building with Nature.

Finally, a sharper focus is needed on layer two (spatial planning) and layer three (crisis management) of multi-layer safety given the events of recent years such as extreme heat, drought and the torrential rainstorms in Limburg. The development of area pilot projects for climate-resilient planning and the intensification of collaboration with the safety region could constitute the first step here. Because of the connection with the freshwater supplies in the Southwest Netherlands, drinking water companies are, in response to the RIVM report *Water availability for the preparation of drinking water until 2030 – bottlenecks and possible solutions* that was published in April 2023, exploring the potential role of the Southwest Delta Area Consultation Platform.

6.6.3 Connections

The 2050 Area Agenda combines the national agendas and the regional economy into inspiring action perspectives. Further elaboration here is in line with recent developments in the policies of the national government

such as the planning decisions in the parliamentary letter on Water and Soil as Leading Factors and the area plans of the NPLG, which also constitute the basis for the approach to the spatial puzzle in the region. There are also plans for collaboration with the NOVEX North Sea Ports District. The parliamentary letter on Water and Soil as Leading Factors sets out planning principles in response to the threat of the salinisation of the coastal area. National and regional governments are collaborating intensively in the Area Consultation Platform to identify the consequences for freshwater availability and users who depend on that availability, including agriculture, and to develop appropriate solutions. There is administrative coordination for this purpose between the three participating provinces at the area level: Noord-Brabant, Zeeland and Zuid-Holland.

Anchoring of municipal role

Further local elaboration and details are needed for the elaboration of the spatial arrangements. The eighteen municipal authorities play an important role here. Anchoring that role took shape, for example, with the joint signing of the new Southwest Delta memorandum of understanding in 2022. The Delta Programme for the Southwest Delta helps municipalities to find solutions in the overlap with the area-specific approaches of the provincial authorities. To encourage this, the Area Consultation Platform called for local initiatives from municipalities and partners. In early 2023, it approved five initiatives and projects, including an integral plan for the use of areas outside the dike in the municipality of Tholen based on local dialogue and a joint fact-finding project

from the Zierikzee-Bruinisse area coalition looking at the effects of sea level rise on salinisation.

Collaboration

The Area Consultation Platform operationalises the area approach on the spatial scale at local, regional, national and international levels, and over time in the triple-jump approach, building on existing agendas. The Area Consultation Platform and the partners in the Netherlands and Flanders are therefore guided by the long-term agendas for the Scheldt estuary and the Flemish-Dutch coastal area. This collaboration focuses on, among other things, sediment management and nature agendas in the Western Scheldt, water level management and water quality in the Ghent-Terneuzen Canal and climate-resilient safety in the coastal area. In addition, the Area Consultation Platform is working with the Meuse and Rhine, and Rhine Estuary-Drecht Towns, Delta Programmes to develop integrated and orchestrated strategies in the Rhine-Meuse-Scheldt Delta. The first steps consist of sharing the outcomes of the Sea Level Rise Knowledge Programme. The Southwest Delta is also involved in the follow-up stages of the Integrated River Management (IRM) programme.

6.7 Coast



Anticipate the effects of sea level rise on the basis of insights from the Sea Level Rise Knowledge Programme



Combine major spatial agendas in the coastal zone with water agendas (including flood risk management) where possible

The objective for 2050 is a safe, appealing and economically strong coast that can cope with sea level rise and its acceleration. This involves taking into consideration other water agendas, transitions (including the energy transition and, in the context of spatial ambitions, future safety agendas) and reducing emissions of nitrogen and CO₂. Rijkswaterstaat maintains the sandy coast annually – where necessary – with sand nourishment.

6.7.1 Perspective for 2050 and later

The sandy coast is in good condition, partly as a result of annual sand nourishment operations. Rijkswaterstaat and the water authorities can maintain that situation on condition that there is enough sand in the North Sea that can be extracted economically. This depends on factors such as the energy transition and other developments with a spatial claim on the North Sea such as wind farms, cable and pipeline routes, fishing, shipping, sand extraction for industry and infill sand.

Reference coastline

The coastal zone plays a crucial role in protecting the hinterland from flooding. This is done with storm surge barriers, flood defences (including locks and pumping stations on the coast), dunes and dams, and adequate amounts of sand to replenish the coastal foundation. The related goals and standards have been set out in legislation and regulations. The Water Act states that any landward movement of the coast shall be prevented or counteracted. A benchmark has been included in the act for this purpose: the reference coastline. It was updated in 2023 and optimised in terms of location in a few places.

The focus is on maintaining the area covered by the coastal zone. In addition, sand nourishment takes place to maintain a structural balance in the amount of sand in the coastal foundation. If the sea level rises faster in the future, more sand nourishment will be needed. In the long term, it may be necessary to strengthen dikes or dunes. The challenge is to keep the coastal zone safe, appealing and economically strong.

All management and maintenance activities must comply with relevant European directives and associated requirements, such as the Birds and Habitats Directives (especially where Rijkswaterstaat is the manager of Natura 2000 areas).

Integrated area approach

As society becomes more complex, the challenges accumulate. In addition to flood risk management, the preferred coastal strategy must be guided by a focus on an attractive and economically strong coast. An integrated area approach offers good opportunities to address this area, but that takes time. Adequate capacity (staffing) is a prerequisite for working in area-oriented ways, intelligent design approaches and effective collaboration. This is where things are becoming increasingly tight: the available capacity is a limiting factor for all government authorities and this difficulty will only become more challenging in the future.

Administrative focus

The Coastal Delta Programme is faced with the task of maintaining the favourable situation we have at present. The challenges for the future – the accumulation of

agendas and sea level rise – means that the administrative focus on the Coastal Delta Programme is increasing.

6.7.2 Developments

Sea level rise

Global sea level rise is accelerating because of climate change. The KNMI (in collaboration with Deltares) is also seeing the first signs of acceleration on the Dutch coast (Klimaat signaal'21; Climate Report and the 2023 Sea Level Monitor). For now, the Delta Scenarios are based on an upper limit of sea level rise of one metre by 2100. The KNMI Climate Scenarios will be published, followed by the new delta scenarios, in October 2023.

In the Sea Level Rise Knowledge Programme, the partners of the Delta Programme are investigating the extent to which the existing strategies for flood risk management, the sandy coast, fresh water and spatial adaptation are sustainable and flexible, and which other solutions are conceivable for the long term. The results will be used by the Delta Programme partners for the periodical evaluation of the agendas and strategies in 2026 (see Section 2.1.2).

The reconnaissance studies of the Sea Level Rise Knowledge Programme indicate that lifetime investments in the coastal zone may need to take into account the impact of sea level rise. Examples of lifetime investments include 360 kV cables for the energy transition and a new nuclear reactor near Petten.

First National Assessment Round

Dunes as the sandy primary flood defences were also included in the first National Flood Probability Assessment Round (see Section 3.2). Almost everywhere, the dunes comply with the safety standards. The coast does not meet the standard at some locations on the islands of Ameland and Schiermonnikoog. In late 2023, the Minister of Infrastructure and Water Management (I&W) will inform the House of Representatives about these outcomes, the associated policy picture and a global cost estimate of the required upgrades.

Spatial development

The spatial boundary conditions for flood risk management must be safeguarded, and remain so, when there are spatial developments in the coastal zone. Only in this way will enough options be kept open in the long term to accommodate flood risk management measures. The results of the Sea Level Rise Knowledge Programme and the objective of the Water and Soil as Leading Factors principle are expected to provide those boundary conditions. It is important for these conditions to be set out in the end in municipal environmental visions. It is expected that this will be possible after 2026. Future options for flood risk management and other water agendas will then become standard components of spatial plans. In that way, it will be possible to prevent developments along the coast that will interfere with safety measures later. It is also desirable to earmark space for future upgrades of flood defences, including dunes, in response to sea level rise.

Sustainability

To keep agendas manageable, carbon emissions have to be cut considerably. In the area of coastline maintenance, the Innovations in Coastline Maintenance (ICZ) programme is looking at ways to achieve major reductions in carbon and nitrogen emissions from sand nourishment operations.

6.7.3 Connections

Water and Soil as Leading Factors

The Ministry of Infrastructure and Water Management is working with partners on boundary conditions and planning decisions to structurally secure the capacity of water and soil systems to cope. An important decision relating to the coast is that coastal expansion is not allowed for the time being. This will prevent unnecessary pressure on the sand stocks, and that is crucial to maintaining the condition of the coast in the face of sea level rise. Pilot projects focusing on knowledge development for flood risk management in the future are still possible if they deliver added value. In addition, the themes of the salinisation of the coast and polders, low peatland areas and the protection of the subsurface are also relevant for the Coast Delta Programme. The Coast Delta Programme is therefore proposing the extension of its focus inland by several kilometres.

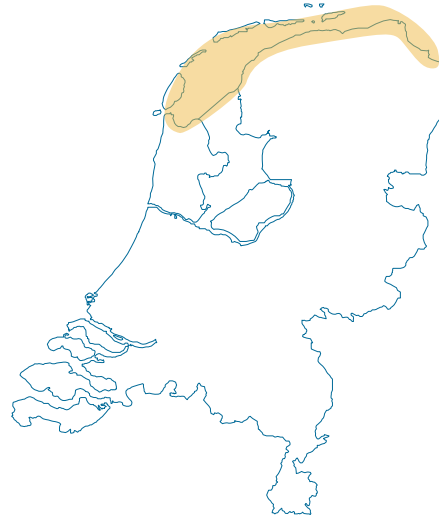
Coastal Pact Monitor

The Coastal Pact (2017) is a special covenant in which government authorities, conservationists and business made agreements to protect coastal values and to monitor



the balance between the protection and development of the Dutch coast. The Netherlands Environmental Assessment Agency (PBL) implemented the Coastal Pact Monitor for the first time in 2022. It demonstrated that the agreements made are actually leading to the desired effects. The monitor looks at both construction for leisure purposes, and at the core qualities and collective values of the coastal zone. The Coastal Pact Monitor has been explained in the PBL report 'The landscape interpreted'. The focus of cooperation in the Coastal Pact continues to be on construction for leisure purposes in relation to the opportunities and threats in the domain of coastal quality. The Minister of the Interior and Kingdom Relations (BZK) reports on this annually to the House of Representatives.

6.8 Wadden area



Intensify collaboration to make the integrated approach to flood risk management possible, with enough capacity and funding



Establish new alliances: new insights from the Sea Level Rise Knowledge Programme and area processes require this



Widen the perspective to extend beyond flood defences to an integrated coastal protection zone (inside and outside the dikes)



Link objectives for the Wadden area to objectives for the hinterland

The preferred strategy adopted in 2014 and confirmed in 2024 for the Wadden Area Delta Programme can be maintained until 2050 and it contributes to the objectives of the Agenda for the Wadden area. The Delta Programme is making progress through innovative and integrated dike upgrades and sand nourishment operations, and developing an integrated strategy for flood risk management for each island. In the years ahead, it will be important to make enough capacity available for a renewed approach to coordinating prevention, water-robust facilities and disaster management on the basis of the latest insights into the consequences of climate change.

6.8.1 Perspective for 2050 and later

The implementation of the current preferred strategy, which was adopted in 2014 and confirmed in 2020, is on track. Flood risk management in the Wadden area is being secured in two ways: the maximum preservation of the current buffering effect of the islands and the intertidal zone, and further strengthening of the flood defences.

Coastal management and sand nourishment

In the Wadden area, the Integrated Coastal Management programme and the strategy of sand nourishment on island coasts will be continued. This will maintain the balance between the coastal foundation and sea level rise until 2050. The programme periodically adapts the size and frequency of, and locations for, sand nourishment operations on the basis of the monitoring of the reference coastline and new insights. The Sandy Coast project is investigating new sand nourishment methods,

for example in the sand nourishment pilot project in the Amelander Zeegat.

Innovative dike upgrades

As much as possible, upgrades to flood defences are made using innovative methods that also contribute to broader area objectives such as strengthening natural values and improving living conditions. All the required dike upgrades are expected to be completed before 2050. In the Kerkhovempolder-Germany dike section, the Hunze and Aa's water authority completed the first section of the Broad Green Dike (750 meters) in 2022. A dike made from 'local clay': clay from a 'clay ripener' made from dredging sludge taken from the Eems-Dollard estuary. The Broad Green Dike is one of the projects in the Eems-Dollard 2050 alliance programme. The Eems-Dollard 2050 built the one-kilometre-long Broad Green Dike in the Delfzijl-Nieuw Statenzijl dike section as a pilot project in late 2022. Through to year-end 2024, Eems-Dollard 2050 will be studying how dike sections can be reinforced with clay from the immediate area. The same alliance completed the dike upgrade for the Eemshaven-Delfzijl section, including the Double Dike pilot project, in 2023. The implementation of the Lauwersmeer-Vierhuizergat dike upgrade began in March 2023. A design for the dike upgrade operations between Den Helder and Den Oever will be made available for inspection in late 2023 and adopted in mid-2024. Implementation will then begin. The Koehool-Lauwersmeer dike upgrade will be tackled section by section on the basis of a phased plan (2022-2025) and implementation phases starting in 2024.

Flood risk management strategies for the Wadden Islands

The municipal authorities of the Wadden Islands and the safety regions of Fryslân and Noord-Holland Noord completed the pilot project Integral Flood Risk Management Strategy for the Wadden Islands in late 2022. No unacceptable flood risk management situations emerged at that time from the project. The proposal for the island municipalities is therefore to implement physical measures only when replacement or new construction activities are planned (which only applies to a very limited extent on the Wadden Islands). In early 2023, the island authorities approved a follow-up to this pilot project. They want to develop a multi-layer flood risk management strategy for each island.

6.8.2 Developments

Environment Act

The introduction of the Environment Act has once again underlined the importance of integrated collaboration and participation. In the years ahead, the partners in the Wadden area will have to organise enough organisational capacity and funding to establish an integrated approach to flood risk management on the mainland and the Wadden Islands for the long term. They can then prepare, integrally and in conjunction with other regional agendas, for the prevention of flooding from the sea and from regional waters, the water-robust design of the hinterland, and disaster management in the event of flooding. A perspective for agriculture is particularly important here.

Sea level rise

The Sea Level Rise Knowledge Programme is exploring the extent to which the island dunes can rise naturally in line with sea level rise and how much sand nourishment will be needed in the future. The knowledge programme is also looking at the consequences of changes in the Wadden Sea for the flood defences on the mainland and Wadden Islands, and on land use behind the dikes. The Wadden Area Delta Programme will include the results of this study in the periodical evaluation of the preferred strategy.

6.8.3 Connections

2050 Agenda for the Wadden area

The implementation of the preferred strategy fits in with the main objective of the 2050 Agenda for the Wadden Area: the sustainable protection and development of the Wadden Sea as a protected nature area and the preservation of the unique open landscape (World Heritage since 2009). The Agenda commits to a safe and resilient Wadden area that can cope with the consequences of climate change and to a dynamic Wadden area that is appealing as a place to live and work.

The intensification of collaboration in the Wadden area on the implementation of the 2050 Agenda for the Wadden Area *and* the development of knowledge relating to the consequences of climate change is resulting in an integrated approach that brings together more and more objectives.



Examples include the Eemszijlen and Future-Resilient Lauwersmeer Area projects, which combine the improvement of the fresh- and saltwater connection, and nature and leisure objectives. The pilot project for the integrated safety strategies for the Wadden Islands, the innovative dike concepts and both the Flood Protection Programme and the Programmatic Approach for the Main Water System are contributing to those objectives. In the context of the 2021-2026 Implementation Programme for the Wadden Area, the Wadden Area Delta Programme is establishing connections between flood risk management and transitions in the area of climate adaptation, and actively contributing the knowledge acquired in the Sea Level Rise Knowledge Programme. The Provincial Programme for Rural Areas (PPLG) and the Blue Environment Vision (BOVI) Fryslân Klimaatbestendig 2050+ link the goals of the Wadden Area Delta Programme to the goals for the hinterland. Elements of Water and Soil as Leading Factors are being included in the periodical evaluation of the preferred strategy for the Wadden area.

Policy Framework for Nature in the Wadden Sea

In the Policy Framework for Nature in the Wadden Sea (of which the draft version is planned for mid-2024), the Minister for Nature and Nitrogen sets out policy decisions about desirable and undesirable developments and activities with a view to protecting and strengthening nature in the Wadden Sea. This includes the interaction between improving natural values and measures for flood risk management in relation to the design of more gradual transitions between water and land. It is currently

unclear what the exact consequences will be for flood risk management measures in the Wadden area.

The Programmatic Approach for the Main Water System and the Flood Protection Programme

The aim of the Programmatic Approach for the Main Water System (PAGW) is to improve the system quality of the main water system through spatial planning measures. For the Wadden Sea and Eems-Dollard, this will include spatial planning measures in the surrounding dike zones. The programme office for the Flood Protection Programme (HWBP) is encouraging integrated approaches and the implementation of measures for flood risk management. Stakeholders in the Wadden area are addressing the challenges relating to flood risk management and the PAGW in joint projects. Integrated dike upgrades of this kind fit in with the preferred strategy of the Wadden Area Delta Programme. Those involved with the flood risk management agendas (HWBP) and the system quality agendas (PAGW) are increasingly seeing opportunities to prepare and implement measures in an integrated way. The HWBP programme office and the PAGW organisation are looking for opportunities to simplify alliances of this kind. As part of the collaboration with HWBP, the National Service for Cultural Heritage (RCE) is involved in the integrated approach. The Wadden Area Delta Programme does not play a role here.

6.9 High-Lying Areas with Sandy Soils



Because implementation costs are rising and climate change is accelerating, a stronger approach is needed to the establishment of a climate-resilient region



Involve all water users on an equal footing in the establishment of resilience to water shortages



Support Water and Soil as Leading Factors with national instruments in addition to regional instruments

The preferred strategy for the High-Lying Areas with Sandy Soils is required to safeguard the availability of fresh water, and make the areas more resilient to the effects of climate change. The ambition is for 20% of the High-Lying Areas with Sandy Soils to fulfil the target for 2050 by 2027. In the sandy areas, the regional government authorities and NGOs who are working together opted for the broadest and most integrated approach possible from the outset. Measures are therefore mostly implemented in projects that target a range of other objectives in addition to freshwater supplies.

6.9.1 Perspective for 2050 and later

The partners in the North, East and South of the Netherlands worked together to draw up a long-term ambition and strategy (for 2050): to make the High-Lying Areas with Sandy Soils in the North, East and South of the Netherlands climate-resilient and water-robust so that the regions can cope with extreme weather and water shortages. This means that an area-wide approach is needed for the intended resilient water/groundwater system for all. A joint approach is required in the regions themselves and with the national government so that all water users are involved on an equal footing in the assessments and in establishing resilience to water shortages.

Long-term perspective

The long-term perspective does not change: the Delta Programme for High-Lying Areas with Sandy Soils assumes that the ambition for 2050 will remain unaltered. The feasibility of the scenario for 2027 has become more questionable recently. This is partly because the

implementation costs are rising due to the war in Ukraine and high inflation. Specifically, this means that the Delta Programme for the High-Lying Areas with Sandy Soils can take fewer measures with the available funding for the 2022-2027 planning period. So less can be done in return for the same investment. Climate change also plays an important role in the feasibility of the objectives for the High-Lying Areas with Sandy Soils. The dry summers of recent years – including the summer of 2022 – have re-emphasised the fact that the groundwater system can no longer be taken for granted. To achieve the goals for 2050, a stronger approach is needed to the establishment of a climate-resilient region. The current approach on the High-Lying Areas with Sandy Soils is adaptive enough and it can also be deployed after 2050. After 2050, the functions will increasingly have to adapt to drier conditions.

6.9.2 Developments

In the High-Lying Areas with Sandy Soils, the coordinating provincial authorities drafted arrangements in 2022 for the implementation of measures for the second phase of the Freshwater Delta Plan from 2023 onwards with regional partners. Most of the measures in the first phase have now been completed. In anticipation of the official decisions, some of the measures for the second phase have already begun. There is a risk of delays due to a lack of capacity, cost increases and the postponement of the passing of the Environment Act.

In September 2022, an independent advisory committee presented the final report ‘No Water, No Future’ about ways to tackle water shortages in Brabant. This report also



produced insights that apply to other parts of the High-Lying Areas with Sandy Soils.

The committee concludes, among other things, that there is an imbalance in the water/groundwater system, that the current system is not robust enough to handle rising demand for water and climate change, and that structural and area-specific measures guided by lessons from the past are needed to prevent damage and crisis situations. The parties working together in Noord-Brabant adopted the advisory report and implemented it as a Drought Agenda. This means that groundwater levels will be raised structurally throughout the province of Noord-Brabant.

6.9.3 Connections

The Delta Programme for High-Lying Areas with Sandy Soils has adopted a broad, integrated approach. And that is necessary: in the sandy areas, freshwater supplies cannot be viewed in isolation from agricultural and nature agendas, drinking water extraction, urban development, cultural history or agendas in rural areas. Measures are generally implemented in projects for the implementation of several other objectives in addition to freshwater supplies.

National Programme for Rural Areas (NPLG)

At the same time, there is a growing awareness that optimising the water system is no longer adequate and that a transition is needed to make the High-Lying Areas with Sandy Soils future-resilient. The National Programme for Rural Areas (NPLG), which focuses on the integration of agendas and solutions, provides

opportunities for acceleration given the additional funding and spatial dynamics.

At the same time, this puts more pressure on already scarce operational capacity and creates a potential dependency in the speed at which water shortages are tackled. It is not yet easy to predict how this will play out in the years ahead.

Water and Soil as Leading Factors

For the High-Lying Areas with Sandy Soils, the parliamentary letter on Water and Soil as Leading Factors is primarily supportive. The Water and Soil as Leading Factors principle fits in well with the approach for the sandy areas. The letter also shows that it is becoming even more important to make choices because not everything is possible any longer. And there is another question: which instruments are available to ensure that the principles of Water and Soil as Leading Factors actually guide action? The years ahead will feature a search for the coordination and deployment of available or additional regional and national instruments, as well as the relevant funding. Given the scale of the transition required in rural areas, it is important to ensure that these available resources can be used to complement each other, and that this continues to be possible in locations such as the brook valleys.

Water, soil and cultural history guide the restoration of the climate-adaptive capacity in the landscape of the Achterhoek region

On the High-Lying Areas with Sandy Soils in the Achterhoek, insights from the past constitute the basis for climate adaptation measures. The area was originally rich in water but that is no longer the case as a result of large-scale interventions such as intensive drainage and land parcelling. Those interventions focused in a one-sided way on water drainage. Climate change, and particularly the increasing probability of water shortages, are now forcing a reversal in that trend: the Achterhoek will have to retain more of the annual precipitation excess.

Estates like 't Medler near Vorden show how water and soil were leading factors for centuries. And they demonstrated which principles work to make the water and soil system more climate-robust. For example, the nearby land area fed the Baakse Beek brook, and agriculture with humid meadowlands conformed to the hydrology of the region. The old meandering brook is now being restored, as are the former meadowlands. Work is taking place to establish a more robust water system for the future by learning from the past. The National Cultural Heritage Service is providing support, for example by mapping out the hydrological system (Baakse Beek) or drafting a Water Biography (Liemers). (See photo on cover: land use follows the water system on 't Medler estate (Gelderland), January 2023)





Chapter 7

Delta Fund



Zedemuden pumping station, Zwartsluis (Overijssel), September 2020

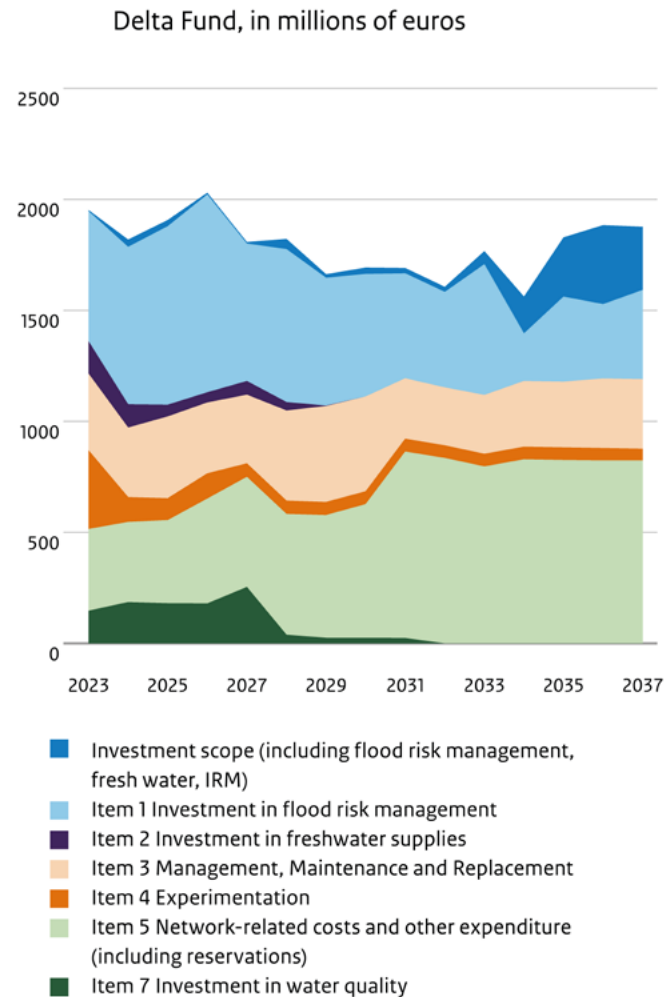


DELTA FUND

In the Delta Programme, we are working on a safe and liveable delta

The national government finances the measures in the Delta Programme from the Delta Fund. Other partners also contribute. Until 2050, the Delta Fund is expected to have € 27.4 billion available for the Delta Programme, while € 30.8 billion is needed.

The agendas for a water-robust and climate-resilient country are expanding and the costs are following. The Delta Commissioner is concerned about the rising budgetary tension, not least because it puts further pressure on operational capacity. If the budgetary pressure continues to increase in the years ahead and/or operational capacity in the market continues to be an obstacle, potentially drastic decisions may be needed with a negative impact on the effectiveness of the Delta Programme.





This chapter describes the financial underpinning of the Delta Programme by comparing the available resources in the Delta Fund with the expected financial requirements of the agendas in the Delta Programme.

The Delta Programme includes measures that will be financed in whole or in part from the Delta Fund: the measures in the field of flood risk management and fresh water for which the national government has full or partial responsibility. The related costs and budgets are compared in order to establish a picture of the financial underpinning of the Delta Programme. In addition, the Delta Programme includes measures for which the national government has no responsibility, such as measures taken by provincial and municipal authorities, and water authorities, in the regional water system. These measures are not financed from the Delta Fund but they will be described in this chapter. The Delta Fund also finances expenditure that is not considered to be part of the Delta Programme, such as expenditure for management, maintenance, and replacement (item 3) and the operating expenses of Rijkswaterstaat that are covered by the goals of the Delta Fund. Those costs and budgets are not part of the financial underpinning of the Delta Programme.

This chapter looks at the developments in the Delta Fund, the resources of the other partners in the Delta Programme, the financial agendas of the Delta Programme through to 2050 and the conclusions of the

Delta Commissioner regarding the financial underpinning of the Delta Programme.

7.1 Delta Fund Developments

The Delta Fund is adopted for a period of fourteen years as part of the national budget. An assessment of the financial underpinning of the Delta Programme makes it necessary to look further ahead, to 2050. This chapter therefore describes the budget available for the Delta Programme in the Delta Fund in two steps: Section 7.1

describes the adopted budget for 2024-2037 and Section 7.2 looks at, among other things, the expected budget for 2038-2050.

7.1.1 Delta Fund Budgets

In the period 2024-2037, the Delta Fund has approximately € 25 billion available, bringing the annual budget to an average of € 1.8 billion. This can be seen in Table 1, which shows the Delta Fund budgets item by item and in total, for the fiscal year 2024 and the period 2024-2037. Figure 3 shows the itemised budgets for the years up to and including 2037.

Table 1 Delta Fund budgets in 2024 and in total (2024-2037) based on 2024 Draft Budget (in millions of euros)

	2024	Total (2024-2037)
Item 1 Investment in flood risk management	709.5	7,667.1
Item 2 Investment in freshwater supplies	105.2	306.7
Item 3 Management, Maintenance and Replacement	312.5	4,590.0
Item 4 Experimentation	111.8	957.3
Item Network-related costs and other expenditure	394.7	10,527.5
<i>of which scope for investment</i>	33.2	1,348.9
<i>of which reservations</i>	5.1	3,766.5
Item 6 Contribution from other national budgets	-	-
Item 7 Investments in water quality	186.0	915.9
Total Delta Fund expenditure	1,819.5	24,964.5



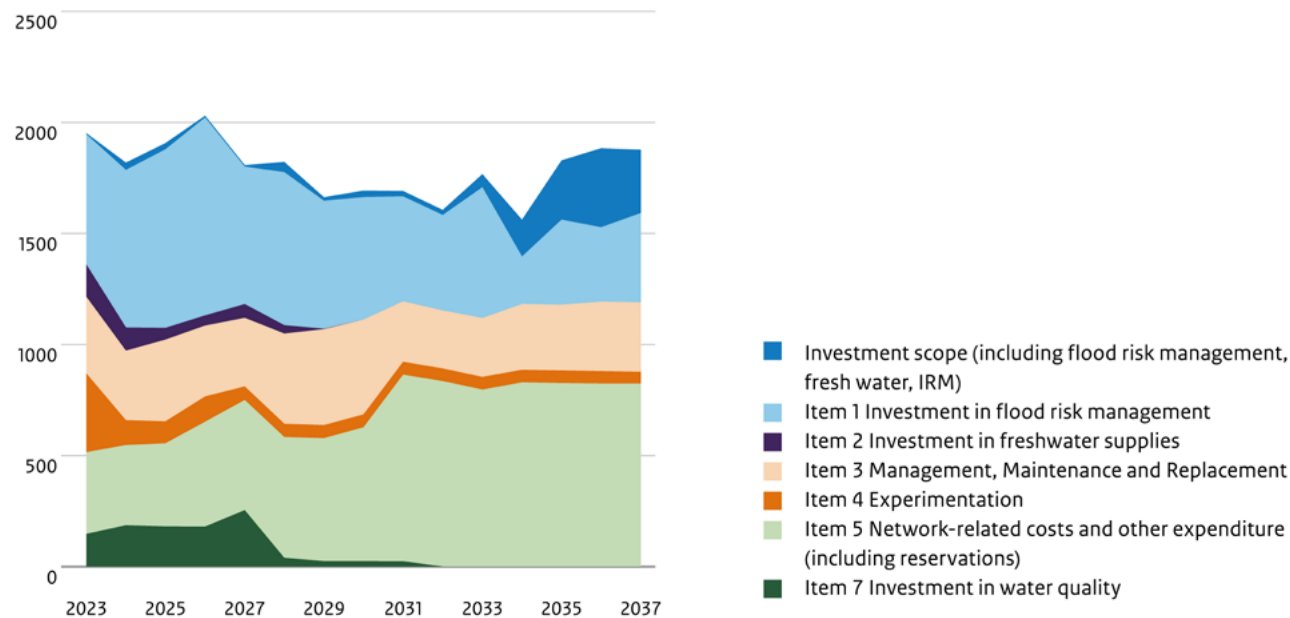
In accordance with the agreed system, the Delta Fund will be prolonged on each occasion by one year up to and including 2037. After compensation for wage and price adjustments, and deducting ongoing obligations (consisting mainly of management, maintenance and replacement, network costs of the Rijkswaterstaat (RWS) and the national contribution to the Flood Protection Programme), this produces new investment scope. A part of the investment scope is added directly to revolving reserves. In 2037, a balance of € 0.3 billion will be available for priority policy agendas for water. In the years ahead, these investment resources will be programmed in

greater detail in an adaptive way on the basis of ongoing processes such as the assessment of primary flood defences, the Integrated River Management Programme, the Freshwater Delta Plan and the Delta Approach for Water Quality and Fresh Water. The total scope for investment will be € 1.3 billion in the period 2024-2037.

The coalition agreement ‘Looking out for each other, looking ahead to the future’ (in Dutch: ‘Omzien naar elkaar, vooruitkijken naar de toekomst’) states that ‘more will be invested in the Delta Fund to eliminate backlogs and accelerate the implementation of the National Delta

Programme. The Delta Programme is continuing to invest in our dikes, dunes and dams. Financing will also be made available to provide better protection for the brook valleys in Limburg and elsewhere.’ The 2023 Delta Programme stated that, of the additional funds set aside in this regard in the Supplementary Item at the Ministry of Finance, only the first part of the reserve for Maintenance for the years 2023 through 2025 (€ 0.6 billion) had been transferred to the Delta Fund. The structural allocation of additional funds for maintenance (€ 0.26 billion per year) has been requested and granted. These resources are indeed not considered to be part of the budgets for investments under

Figure 3 Delta Fund budgets by item and in total (2023-2037) based on 2024 Draft Budget (in millions of euros)





the Delta Programme but they do eliminate the threat that shortfalls in the management and maintenance of Rijkswaterstaat networks could squeeze the scope for investment for the goals of the Delta Programme. Furthermore, the intention is to use some of these budgets in the long term for climate adaptation measures (acceleration of the Delta Programme). However, as long as this is not explicitly stated in the budget, it cannot be included in the calculations.

A request for € 33 million of the € 300 million earmarked for brook valleys in Limburg and elsewhere has been submitted to the Ministry of Finance for the purposes of the budget in 2024. The rest will be requested in 2025, with the elaboration of the agreements from the July 2022 Administrative Agreement on Flood Risk Management and Space in Limburg.

In addition to the aforementioned addition of extra resources to the Delta Fund as a result of the coalition agreement, and wage and price adjustments, there is a reduction in the budgets in the Delta Fund as a result of a government-wide funding agenda based on decisions for the 2023 Spring Budget.

7.1.2 Policy reservations

For foreseen future expenditure on programmes and projects for which a go decision has not yet been made, reserves have been included under Item 5 of the Delta Fund, sometimes subject to the condition of co-financing from other parties. In the 2024 Draft Budget for the Delta Fund, the following reserves relevant to the Delta Programme have been made:

Regional defences managed by the national government, € 185 million. In order for the regional defences managed by the national government to meet the standards set out in the Water Decree, a reserve has been made within the investment scope.

Integrated River Management (IRM), € 617 million and, from 2032 onwards, € 80 million a year through to year-end 2050. This programme brings together the national river agendas – including flood risk management, shipping, water quality and quantity, riverbed location and vegetation management – to achieve synergy in programming and implementation. These agendas are also linked, where this leads to synergy, to urgent regional agendas. Through the Integrated River Management (IRM) programme, the national and regional governments are elaborating policy further for the preferred strategy for flood risk management with respect to rivers, as set out in the National Water Plan 2016-2021. The periodical evaluation of the preferred strategy for Rivers was also shaped on this basis, as described in the 2021 Delta Programme.

Fresh water, € 420 million. This relates to the continuation of the policy (continuation of the 1st freshwater package) to prevent damage caused by water shortages and salinisation. The Netherlands was dry in 2022 for the fourth time in five years, particularly in the High-Lying Areas with Sandy Soils. Moreover, there was an effective water shortage this year and in 2018. This demonstrates that we need to do more to prevent problems, such as those on the High-Lying Areas with Sandy Soils and in the IJsselmeer region. To this end, € 42 million has been reserved in the Delta Fund each year from 2028 onwards.

Programmatic Approach for the Main Water System (PAGW), € 672 million. This relates to the preservation and improvement of nature and water quality in order to make the main water system future-resilient, with high-quality nature that fits in well with a strong economy. PAGW will continue through to the end of 2050. € 85.8 million a year and € 66 million a year will be added to the policy reserve for the periods 2030-2040 and 2041-2050 respectively to finance the urgent agenda and measures for a robust ecological network.

Research reserve, € 24 million. These funds have been pooled in a research reserve for the general water agenda. This includes research on flood risk management, rivers, improving water quality and water quantity (freshwater supplies). This reserve can be drawn on when the research agendas have been further elaborated and financially substantiated in later years. € 2 million will be added annually to the existing policy reserve.

Statutory Assessment Instruments 2035, € 47 million. The authorities managing primary flood defences (the water authorities and central government) are required by law to submit reports at least every twelve years to the Minister of Infrastructure and Water Management on the condition of these defences. Further rules on the assessment in this respect are set by ministerial regulation. These rules are known as the “Statutory Assessment Instruments”. The scope of this programme includes software, technical guidelines, regulations, procedures, support, management and maintenance. The reserve serves to cover the required annual costs for this programme in the period 2024-2035.



IJsselmeer area, € 3.6 million: With the regional partners, the Ministry of Infrastructure and Water Management will be working during the period 2023-2026 to prepare for the periodical evaluation of the preferred strategy and the Delta Decision for the IJsselmeer Area in 2026. In the years ahead, work will take place on an integral analysis of promising alternatives and new policy decisions. From 2030 onwards, a policy reserve of € 3.6 million will be established with a structural effect. It will be used when there is a clearer picture of the impact of the Delta Decision in 2026, and of the elaboration and implementation of the policy in subsequent years.

7.2 The financial underpinning of the Delta Programme

This section describes the financial underpinning of the Delta Programme by comparing the available resources in the Delta Fund ([in Section 7.1](#)) with the expected financial requirements of the agendas in the Delta Programme. The expected financial requirements of the Delta Programme are based on an annual adjustment for inflation.

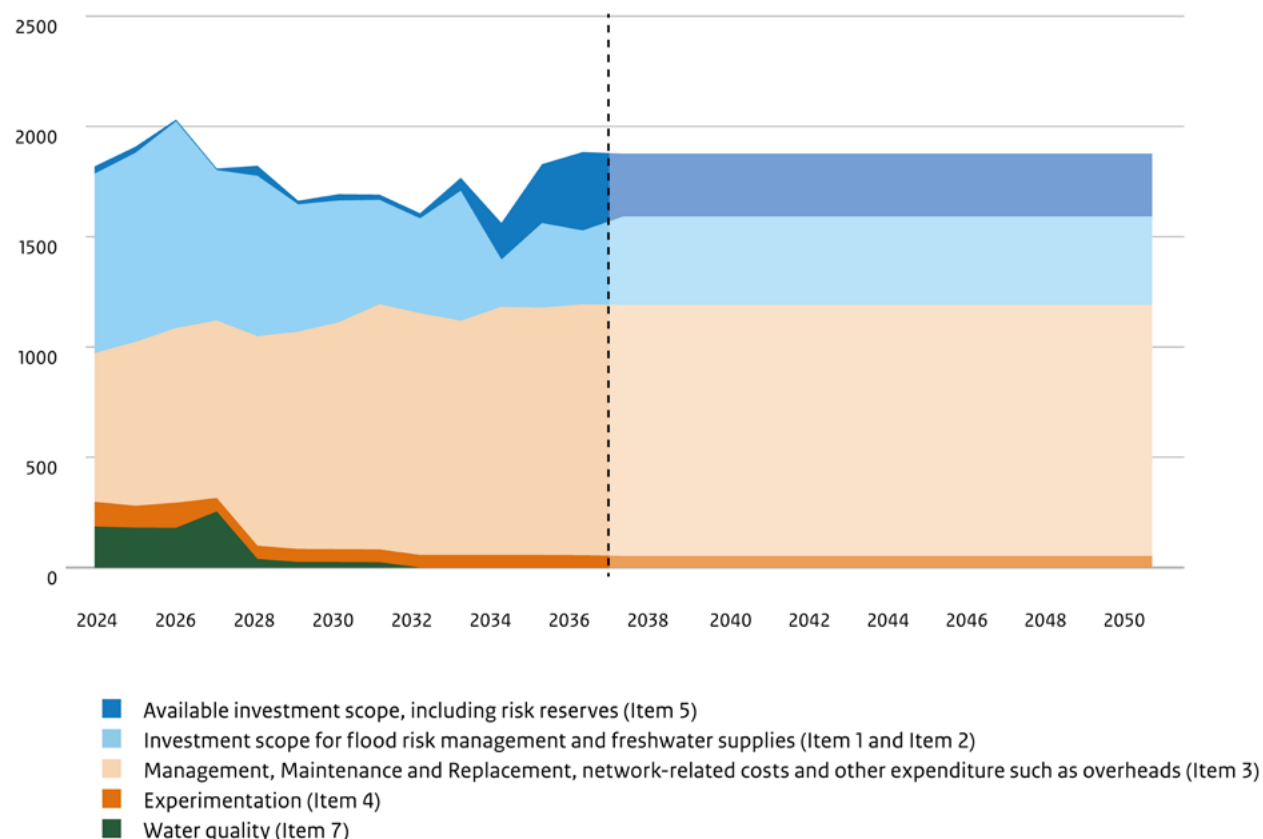
7.2.1 Available budgets in the Delta Fund for the Delta Programme

Assuming the Delta Fund is extrapolated by € 1.88 billion annually (this includes the additional resources from the coalition agreement), approximately € 24.4 billion will be available in the Delta Fund in the period 2038-2050. Some of these resources are available for projects considered to be part of the Delta Programme, but not all. The Delta

Fund also covers national government expenditure outside the Delta Programme, such as the costs of managing and maintaining the main water system (Item 3), and network-related costs and other expenditures (a large proportion of Item 5).

The tentative extrapolation in Figure 4 is based on the year 2037. The Delta Commissioner has assumed here that the earmarked budgets for new flood protection measures at the water authorities will be continued after 2028 in accordance with the agreements between

Figure 4 Tentative extrapolation for Delta Fund (in millions of euros)





the national government and the water authorities as anchored in the Water Act. The extrapolation shows that, of the approximately € 1.88 billion available annually in the Delta Fund during the period 2038-2050, approximately € 1.14 billion a year has been set aside for management, maintenance and replacement (Item 3) and network-related and other expenditure (Item 5). In terms of investment budget, this means that approximately € 0.73 billion a year is available in the period 2038-2050 for the Delta Programme. This is the budget for the available or earmarked budgets for new flood risk management measures (Item 1), fresh water (Item 2) and the reserves relevant to the Delta Programme (Item 5).

A total of € 12.2 billion in investment budget will be released for the Delta Programme for 2038-2050. € 5.8 billion of that sum will be invested in flood risk management and fresh water. Approximately € 2.7 billion has been earmarked for foreseen expenditure in the future for which go decisions have not yet been made, and approximately € 3.7 billion of the investment scope has not yet been invested. In the period 2015 through to 2037, on the basis of actual and budgeted budgets, approximately € 15.2 billion will be available for the Delta Programme. This means that, calculated from the start of the Delta Programme in 2015, a total of approximately € 27.4 billion will be available through to the end of 2050 for the flood risk management and freshwater agendas of national importance. In addition, resources are expected to come from partners in the Delta Programme other than the national government and the water authorities,

such as the provincial and municipal authorities (as explained in Section 7.4).²⁹

7.2.2 Expected financial magnitude of the Delta Programme agendas

Inflation

The financial magnitude of the Delta Programme's agendas for the period 2015-2050 was subject to a periodical evaluation in the 2021 Delta Programme (DP2021), and estimated at € 25.9 billion (2020 price level). The corresponding budgets have been adjusted in line with the 2023 price level with the payment of adjustments for wages and prices. In order to make a proper comparison between the financial magnitude of the agendas (costs) and the budgets, the costs must also be adjusted annually for inflation, as was also explained in DP2021. To adjust the cost estimate in line with inflation, the Delta Programme uses the composite index followed by Rijkswaterstaat, which matches the cost categories used for the Delta Programme. On the basis of that index, the adjustment for inflation by comparison with the DP2023 is 6.8%. Corrected in line with the 2023 price level, the costs of the Delta Programme agendas are estimated to be a total of € 30.8 billion.

²⁹ These resources make a crucial contribution to achieving the goals of the Delta Programme, such as other government authorities' investments in spatial adaptation. For the assessment of whether the resources in the Delta Fund are sufficient to cover the estimated costs of the measures in the Delta Programme, however, they have not been taken into consideration here (either in terms of the budgets assumed to be available or in terms of the cost estimate for the agenda).

That is € 3.4 billion more than the assumed available budget of € 27.4 billion.

Increasing challenge

The above estimate of the costs of the agendas is expected to increase further in the years ahead because of the increasing size of the challenges for all three themes of the Delta Programme. Item 5 of the Delta Fund includes a range of reserves for the expected agendas of the Delta Programme. In addition, there is an investment margin available that has not yet been used. In the years ahead, these investment resources will be programmed further in an adaptive way.

For the Spatial Adaptation theme, a working group is assessing the structural funding needs and how they can be funded. The result is expected in 2024. Budgets have been set aside for the Flood Risk Management and Fresh Water themes in the period 2024-2037. The Delta Decision on Spatial Adaptation stipulates that the joint ambition of the national government, provinces, municipalities and water authorities is for the Netherlands to be as climate-resilient and water-robust as possible by 2050 at the latest. It has also been agreed that the national government will ensure that national vital and vulnerable processes will be more resilient to flooding by 2050 at the latest. The Delta Fund may be used to cover some of the costs. It should be pointed out in this context that there are also adjoining programmes that do not call on the Delta Fund, or only do so to a limited extent, but that may provide the National Delta Programme with synergy opportunities. They include the National Programme for Rural Areas, the National Approach to Climate Adaptation

in the Built Environment and the National Approach to Vital and Vulnerable Processes.

For Spatial Adaptation, the recommendations of the Pluvial and River Flooding Policy Platform in the final advisory report 'Prevention isn't possible, preparation is' will lead to a larger agenda and budget requirement.

In its final advisory report, the policy platform makes 21 concrete proposals for changes to the policy on pluvial and river flooding to make the Netherlands better prepared for a period of extreme precipitation and allow it to work on impact mitigation to prevent the failure of critical functions. That requires financing. Some of this work will devolve to utilities and regional governments, but it may also call on the resources in the Delta Fund earmarked for this purpose as a result of the coalition agreement. Supraregional stress tests should contribute to a clearer picture of risks and the required measures and investments. A picture of the funding required is expected to become available in 2024.

The challenges are also increasing with respect to the themes of Flood Risk Management and Fresh Water.

The IRM programme and the Sea Level Rise Knowledge Programme are examples of this and they will result in greater demands on the investment scope in the Delta Fund. In time, the Flood Protection Programme may also call on that investment scope given the pressure on its long-term financing (until 2050). Research projects such as the evaluation of the Water Act and the Global Cost Estimate for the agenda relating to the upgrading of the primary flood defences through to 2050 consider this in greater detail. The safety agenda resulting from the National Safety Assessment is an important building block

for this purpose. The Flood Protection Programme alliance is working on long-term programming in 2023 that will provide a clearer picture of the feasibility of financing for the upgrade agenda through to 2050. This will also include the effects of the problem of nitrogen deposition.

Budget utilisation in the short term

Some programmes have yet to get up to speed, causing delays in execution and/or, in some cases, the failure to use up budgets in the short term. Not least given the scarcity of building materials and a tight labour market. The Flood Protection Programme is an example of delays in execution and it has effectively deployed several measures in response, effectively preventing under-utilisation. For example, the implementation plan 'Towards a realistic and reliable Flood Protection Programme' is in progress. This short-term development of 'getting up to speed' and/or the under-utilisation of the budget does not (automatically) mean that funding is released for other agendas.

7.2.3 The financial underpinning of the Delta Programme

Last year, there was a budget gap of € 2.9 billion and the Delta Commissioner drew the conclusion that the operational capacity of the Delta Programme is threatened by the tight labour market, prices and the availability of commodities and building materials, and a larger agenda. It was pointed out that the pressure on the budgets was manageable given the long periods of time involved, the adopted scope, the additional funds from the coalition agreement and the margins of uncertainty that are

common in cost estimates for such a long period. With respect to DP2024, the tentative extrapolation of the available budget for investments and other expenditure associated with the Delta Programme in the Delta Fund through to 2024 is € 27.4 billion. The re-evaluated estimate of the total costs of the Delta Programme is now € 30.8 billion, which is why the Delta Commissioner notes that the budget gap has increased further to € 3.4 billion. The Delta Commissioner is of the opinion that, in principle, the rising budget gap in the medium term is still manageable but that, given the increasing size of the challenges involved, operational capacity is even more under threat. Increasingly, budgetary pressures and feasibility are concerns for the Delta Commissioner. If this budgetary pressure continues to increase in the years ahead and/or operational capacity in the market continues to be an obstacle, potentially drastic decisions may be needed, with a negative effect on the scope, the pace of implementation and priorities, and therefore the effectiveness, of the Delta Programme. The Delta Commissioner considers this to be undesirable. So in this context, too, the second periodical evaluation (DP2027) of the Delta Programme represents an important moment for an assessment.

Chapter 1 described in detail the importance of moving ahead in the Delta Programme. This importance also applies to the growing challenges and the identification of the budgets required. From the perspective of cost efficiency as well, the Delta Commissioner concludes that it is important to be in control and not to be left to the mercy of the cost of inaction associated with climate damage. The Delta Programme is one of the programmes taking measures to mitigate climate damage. The Climate Damage



Estimator³⁰ brings together knowledge about the costs of damage from climate change and provides estimates for the themes of drought, heat and flooding for the period through to 2050: from € 77.5 billion to € 173.6 billion. The magnitude of the potential damage underscores the need for the development of efficient measures and the timely availability of enough funding to allow for the timely execution of these measures as well.

7.3 Other resources from national government for the Delta Programme

The government funds available to achieve the goals of the Delta Programme come largely from the Delta Fund. However, other budgets in the national budget also serve to achieve the objectives of the Delta Programme. It is not possible here to present an exhaustive description of these budgets but the following larger items will serve to give an impression:

- The National Growth Fund will invest € 20 billion between 2021 and 2025 in large-scale investment projects and programmes with a minimum grant amount of € 30 million per proposal. Proposals must contribute to the sustainable earning capacity of the Netherlands. In the second round, a number of proposals were honoured with a positive impact on the

³⁰ Information from www.klimaatschadeschatter.nl. This estimate includes damage that is virtually unavoidable, such as damage to foundations of houses where measures will at most result in delay and damage that cannot be effectively prevented.

goals of the Delta Programme. They include the ‘Water Technology Growth Plan’ (€ 135 million) and the ‘NL2120, the green earning capacity of the Netherlands’ proposal (€ 110 million, of which € 40 million has been granted subject to conditions). See www.nationaalgroeifonds.nl for more information.

- The Mobility Fund (the successor to the Infrastructure Fund) contains the expenditures estimated for ‘dry’ infrastructure projects, which are prepared and implemented under the responsibility of the Minister of Infrastructure and Water Management. This also includes investments in the main waterways network. The IRM programme combines navigability goals with those for flood risk management, nature development and leisure, among others. The MIRT 2020 Administrative Consultation Platform agreed to address bottlenecks for shipping on the major rivers and to seek synergy with the objectives stated in IRM with a contribution from the Mobility Fund.
- The budget of the Ministry of Agriculture, Nature and Food Quality also includes expenditure in support of the objectives of the Delta Programme. Examples include investments in climate-adaptive nature and agriculture, the transition to circular agriculture, sustainable agricultural land management, nature and biodiversity on land and in the large waters in the Wadden area, the Southwest Delta, the river area and the IJsselmeer area. Circular agriculture, agricultural land management and climate-adaptive agriculture reduce freshwater demand for agriculture.

Climate-adaptive nature contributes to the implementation of the freshwater agenda and supports adequate freshwater supplies for vulnerable functions. Through

PAGW-HWBP joint projects, integral flood risk management measures are also made possible and the flood risk management agenda is reduced in size (foreshores stabilise dikes, mitigate piping and reduce wave development, both when water levels are normal and when they are high). In addition, work is still continuing on the National Programme for Rural Areas (NPLG) and the associated Transition Fund, of which € 811 million has been earmarked for the Water Framework Directive (WFD). This is being used for the large-scale restoration of brook valleys in areas of the country with sandy soils. On the basis of an analysis³¹, it has been estimated that this will eventually reduce leaching in areas of the country with sandy soils by 40-70% for nitrogen and 20-30% for phosphorus. This will make it possible to reduce the share of agriculture in brooks for the purposes of achieving the WFD objectives.

- The Ministry of Education, Culture and Science also provides co-funding through matching for water projects in the Heritage Deal (budget through ‘Heritage Counts’ policy). The same ministry is also contributing to the IJsselmeer Area Agenda.

³¹ Annex to Parliamentary Paper 35 334, no. 170

7.4 Resources from other partners

The national government, water authorities, municipalities, provinces and drinking water companies all have a role in protecting our country from flooding and/or safeguarding sufficient supplies of clean drinking water. Together, these organisations spent € 8.2 billion for this purpose in 2022. That is less than 1% of the country's gross domestic product (GDP). Water authorities account for 44% of this spending, municipal authorities for 22%, drinking water companies for 17%, the national government for 15% and the provincial authorities for 2%.³²

In addition, the water authorities, and the provincial and municipal authorities, invest in the agendas of the Delta Programme, just as the national government does. Working with the national government, they rely on co-financing to implement measures from the Flood Risk Management, Spatial Adaptation and Freshwater Delta Plans.

The working regions for spatial adaptation, in which water authorities, provincial and municipal authorities work together, contribute two-thirds of the co-financing for the packages of measures they submit for a contribution from the Climate Adaptation Stimulus Scheme (up to a maximum of the amount determined for each working region on the basis of the allocation formula).

³² Staat van Ons Water 2022 – Rapportage over de uitvoering van het waterbeleid in 2022.

7.4.1 Water authorities

Investments

The water authorities invest in measures in the regional water system and contribute half (approximately € 7 billion of the current estimate of approximately € 13.7 billion for 2014-2050) of the funding for the Flood Protection Programme.

Water authorities focus on establishing and maintaining the quality of flood defences and managing watercourses, and work to ensure that there is always enough good-quality water (not too much and not too little). They do this with pumping stations and with tens of thousands of smaller water-based engineering structures and all kinds of design measures. In addition, water authorities treat waste water from businesses and households in wastewater treatment plants.

The water authorities have to invest heavily in this infrastructure, in part because of climate change, sea level rise, land subsidence, urbanisation, salinisation, stricter environmental standards, the energy transition that is required and the closing of commodity cycles. The water authorities' investment agendas for the years ahead show that they will together invest an average of € 2.25 billion a year in the period 2023-2026 (see Figure 5). Figure 6 shows how the total amount for these four years is allocated to the agendas for each water authority.

Flood Risk Management Programme (HWBP)

Investments in flood defences account for the largest share of total investments made by the water authorities

(see Figure 5). These are mainly investments in the primary flood defences. Since 2011, the water authorities have participated in the HWBP and the financing of the upgrade of the primary flood defences is the joint responsibility of the water authorities and the national government. Since 2014, this financing has consisted of equal contributions from the water authorities and the national government. This contribution is recorded as a receipt to the Delta Fund and has also been included in Figure 3. The amount has been indexed annually since 2016. In 2023, the water authorities will contribute approximately € 225 million to financing.

7.4.2 Provincial authorities

The provincial authorities contribute to the Delta Programme in several ways: through staffing in the various programme teams or its own organisation, with financial contributions to sub-programmes or with contributions to research or measures. The provincial authorities work in particular on coordinating the various agendas in their areas in line with the agendas of the Delta Programme. Examples are the linkage between agriculture, nature and freshwater supplies or linking dike upgrades with improving the quality of the locality.

The scope of their efforts – in terms of staffing and funding – differs from one region to the next and depends on the provincial agendas in the region concerned. Concrete examples are provided in Chapters 3 to 6 inclusive.

In flood risk management projects, the provincial authorities invest in synergy opportunities and area



Estimates of investment expenditure, average per year 2023-2026 (totaal € 2.25 mld.)

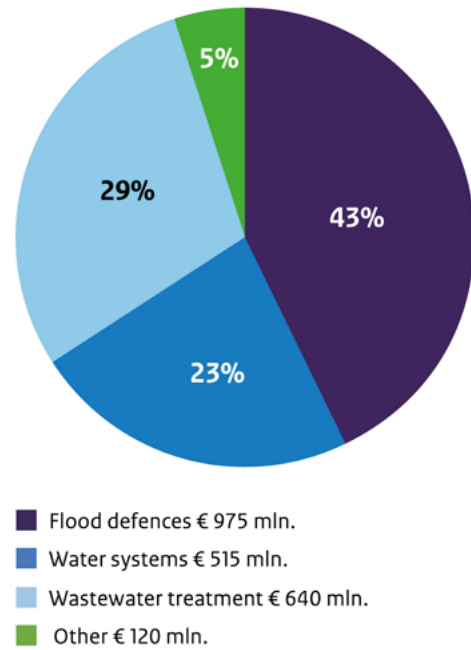


Figure 5 Average annual capital expenditure of the water authorities from 2023 to 2026 as allocated to the agendas
Source: Unie van Waterschappen, March 2023

Estimated investment expenditure, 2023-2026

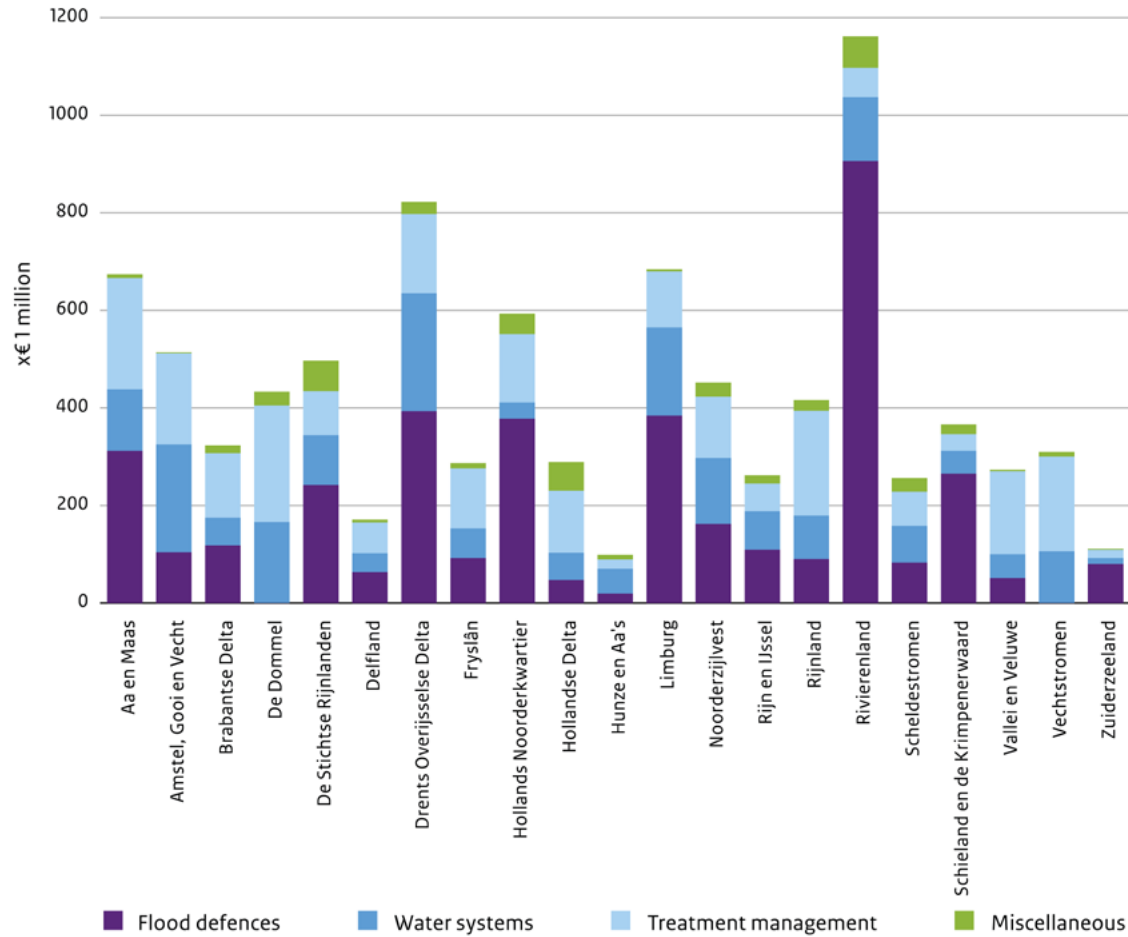


Figure 6 Planned total capital expenditure per water authority from 2026 to 2025 as allocated to the agendas
Source: Unie van Waterschappen, March 2023



deposition, water quality (WFD), climate and other synergy benefits meet. In addition, programmes are in place with measures for brook restoration, water conservation in areas of the country with sandy soils, studies of the optimisation of water systems and making public drinking-water supplies future-resilient, such as the periodic evaluation of the flood protection policy. In the Drought Policy Platform, the provincial authorities have contributed to shaping the policy recommendations regarding groundwater and vulnerable nature; they are currently engaged in the implementation of the follow-up to these recommendations.

In the area of spatial adaptation, the challenge for provincial authorities lies primarily in linking climate adaptation to major spatial agendas such as housing construction, the energy transition and regional spatial planning. In working regions and freshwater regions, provincial authorities, working with the partners in the region, are using stress tests (regional and otherwise) to identify spatial adaptation agendas and making agreements about the necessary measures through risk dialogues. They record the outcomes in implementation agendas (see also concrete examples in Chapter 5). In the years ahead, the provincial authorities – working alongside municipal authorities, water authorities and the central government – will provide an additional impetus for work on climate adaptation and the implementation of measures, as agreed in the Administrative Agreement on Climate Adaptation.

7.4.3 Municipal authorities

Municipal authorities fulfil a range of roles in terms of addressing climate change and urban water management. As policymakers and regulators, the authorities work on areas such as embedding climate adaptation in the municipal environmental vision documents, sector programmes, and environmental plans. In addition, they determine the approach to rainwater and groundwater drainage in drainage plans. Rainwater is increasingly stored above ground or drained away, for example via swales, green strips and roads designed for this purpose. In the role of owner, many municipalities are investing in making social property (such as schools) and public areas climate-resistant, for example by adding height differences or creating more greenery and open water.

Many municipalities are also adopting an initiator role, taking the lead in new initiatives with several parties, such as corporations and water authorities. Here, they can also act as co-financiers to get initiatives on the move and maintain momentum. In a working-region context, municipalities working with partners in the region use stress tests (regional and otherwise) to identify spatial adaptation agendas and make agreements about the necessary measures through implementation agendas. According to figures from Statistics Netherlands, the budgeted income from the sewage rates will increase by 4.5% to € 1.9 billion in 2023. The increase in the rates is related to, among other things, the increased costs of maintenance, the management of the drains system and the expansion of the area covered. Municipal authorities are allowed to spend the revenue on municipal water activities only and they must not exceed the level needed to cover costs.

7.4.4 Developments in financing by the financial sector

In the Netherlands, the public financial institutions in particular play a role in financing climate adaptation. In particular, BNG Bank helps municipalities and housing associations with sustainability financing, including adaptation financing (albeit to a limited extent). Furthermore, the Dutch Water Authorities Bank (NWB Bank) is also the main financier of the water authorities. As the financier of about 90% of the water authorities' loan capital, the NWB provided € 1.3 billion in 2021 and € 942 million in 2022. Much of this is financed by the NWB with the 'Water Bonds'. The Delta Programme is an integral part of these Water Bonds, because some 40% of

³³ See, for example, the [River dossier for water extraction in the Rhine Delta](#).



the water authorities' annual investments are related to the primary flood defence system of the Netherlands. NWB Bank raises part of its financing by issuing water bonds, which are purchased mainly by international institutional investors. The Delta Programme is crucial in this regard; among other things as a CPI for the number of kilometres of primary flood defences (upgraded and otherwise), but also for the international image of the Netherlands as a safe and reliable country for investment.

The private financial sector is still evolving in the area of climate adaptation. It expects to evolve in this area in the years ahead and make a more significant contribution to climate adaptation and its encouragement, both by providing financial products in order to further adaptation and by pricing risks.



Annex 1 Programming tables for Delta Plan for Flood Risk Management

Tables B1.1 to B1.7 (inclusive) in this annex show the programme for the Flood Protection Programme (HWBP) for the period 2024-2029/2035.¹
A description of the projects can be found in the [HWBP Project Book](#) to be published in the autumn of 2024.

Table 1.1 Knowledge and innovation agenda

Code	Management Authority	Project name	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
	Programme directorate	Reservation for innovation	■														
	Programme directorate	Knowledge and Innovation Programme (KIA)	■														
33T	HH Hollands Noorderkwartier	POS Kunstwerken	■														
	Rijkswaterstaat	Embankment Suite-GEOLIB															
13K	WS Aa en Maas	Cuijk - Ravenstein innovatie															
33M	WS Amstel, Gooi en Vecht	JLD Dijkstabilisator (POV-Macrostab- bilititeit) Nastel- en monitoringsfase	■														
33Q	WS Drents Overijsselse Delta	Onderzoek Gras op Zand															
33X	WS Drents Overijsselse Delta	Dijken en Natuur - een symbiose	■														
33Z	WS Drents Overijsselse Delta	Praktijkonderzoek opbarsten bij dijken	■														
33N	WS Fryslan	Onderzoek Asfaltbekleding (POV-W)															
33N	WS Fryslan	Continuering monitoring degeneratie asfalt	■														
33S	WS Hollandse Delta	Proef Piping Hedwigepolder															
17D	WS Hunze en Aa's	Pilot Kerkhovenpolder- Duitsland (Brede groene dijk)	■														
33I	WS Hunze en Aa's	Monitoring Gras- en Kleibekleding fase D POV-W	■														
19D	WS Limburg	Tranche 2 innovatie Steyl Maashoek															

Legend: ■ Innovation

¹ See also [Final Programme Proposal for HWBP 2024-2035](#).



Table 1.1 Knowledge and innovation agenda

Code	Management Authority	Project name	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
19I, 19N, 19P, 19Q	WS Limburg	Tranche 1 Planuitwerking innovatief														
33L	WS Limburg	POV Dijkversterking Gebiedseigen Grond														
18A	WS Noorderzijlvest	Eemshaven-Delfzijl - MJVM														
18A	WS Noorderzijlvest	Eemshaven-Delfzijl - Dubbele Dijk														
33AB	WS Noorderzijlvest	Erosiebestendigheid klei buitenkant dijk														
22E	Rivierenland	Gameren innovatie GZB														
22L	Rivierenland	Dijkversterking Wolferen - Sprok														
33D	WS Rivierenland	POV Piping														
33E	WS Rivierenland	POV Macrostablieit														
33U	WS Rivierenland	De Innovatieversneller														
33V	WS Rivierenland	Future dikes														
33Y	WS Rivierenland	Pilot Soilmix Heaveschermen														
33AA	WS Rivierenland	Zuid-Beveland West, Westerschelde Hansweert - innovatie -														
24AG	WS Scheldestromen	Grebbedijk innovatie PU														
25P	WS Vallei en Veluwe	POS HEEL														
33R	WS Vallei en Veluwe	Dashboard Duurzaamheid														
33AC	WS Zuiderzeeland	Erosiebestendigheid overgangen dijkbekleding														
33AD	WS Zuiderzeeland															

Legend: ■ Innovation



Table 1.2 Programming of measures for Flood Protection Programme 2023-2028/2034

Code	Management Authority	Project name	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
02C	HH De Stichtse Rijnlanden	Versterking voormalige C-kering HDSR (GHIJ)	Implementation	Implementation												
02D	HH De Stichtse Rijnlanden	Wijk bij Duurstede Amerongen (WAM)	Implementation	Implementation												
02E	HH De Stichtse Rijnlanden	Salmsteke	Implementation													
02F	HH De Stichtse Rijnlanden	Culemborgse Veer-Beatrix Sluis (CUB)	Implementation	Implementation												
02G	HH De Stichtse Rijnlanden	Salmsteke Schoonhoven (SAS)	Implementation	Implementation												
02H + 02J	HH De Stichtse Rijnlanden	Jaarsveld - Vreeswijk	Implementation	Implementation												
02I	HH De Stichtse Rijnlanden	Irenesluis - Culemborgse Veer	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
02B	HH De Stichtse Rijnlanden	Waaierluis te Gouda														
03I	HH Hollands Noorderkwartier	Noordzeekanaal														
03O	HH Hollands Noorderkwartier	Den Oever - Den Helder DODH	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
03S	HH Hollands Noorderkwartier	Koppelstuk Markermeerdijk	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
03Y	HH Hollands Noorderkwartier	Koppelstuk Durgerdam	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
03E	HH Hollands Noorderkwartier	Wieringermeer C kering	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
03V	HH Hollands Noorderkwartier	Aanpak Kunstwerken														
03L	HH Hollands Noorderkwartier	Helderse Zeewering	Preliminary study	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
03Z	HH Hollands Noorderkwartier	Nieuwe Diep	Preliminary study	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
05C	HH van Rijnland	Verbetering IJsseldijk Gouda Stadsfront Voorlanden spoor 3	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
05E	HH van Rijnland	IJsseldijk Gouda (VIJG) spoor 2	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
05F	HH van Rijnland	Kunstwerken Spaarndammerdijk	Preliminary study	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
05G	HH van Rijnland	IJsseldijk Gouda (VIJG) spoor 4 (GHIJ)	Preliminary study	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
06K	HH van Schieland en de Krimpenerwaard	Krachtige IJsseldijken Krimpenerwaard (KIJK)	Fast Lane	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
06D	HH van Schieland en de Krimpenerwaard	Capelle-Zuidplas	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
13D	WS Aa en Maas	Ravenstein - Lith	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation

Legend: Preliminary study Planning Implementation Fast Lane Phase not scheduled



Table 1.2 Programming of measures for Flood Protection Programme 2023-2028/2034

Code	Management Authority	Project name	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
13K	WS Aa en Maas	Cuijk - Ravenstein, excl. uitwisselingsbijdr dijkversterking rivierverruiming	Planning	Implementation												
13	WS Aa en Maas	Dijkkruising Oeffelt														
13H	WS Aa en Maas	Boxmeer - Cuijk (deel), excl. uitwisselingsbijdrage rivierverruiming			Preliminary study			Planning		Implementation						
13Y	WS Aa en Maas	Lith - Bokhoven	Preliminary study	Preliminary study	Planning			Fast Lane		Implementation						
13Z	WS Aa en Maas	Doeveren	Fast Lane	Implementation												
14E	WS Brabantse Delta	Moerdijk - Drimmelen	Preliminary study	Planning		Implementation										
14F	WS Brabantse Delta	Standhazense Dijk	Implementation													
34M	WS Drents Overijsselse Delta	Stadsdijken Zwolle (15E)	Implementation													
34L	WS Drents Overijsselse Delta	Genemuiden-Hasselt							Preliminary study	Planning						
34O	WS Drents Overijsselse Delta	Mastenbroek IJssel	Preliminary study	Planning		Implementation										
34U	WS Drents Overijsselse Delta	Zwolle-Olst	Fast Lane	Implementation												
34AK	WS Drents Overijsselse Delta	Vecht - Stenendijk Hasselt														
34AN-34AQ	WS Drents Overijsselse Delta	Vecht Dalfsen Zwolle	Planning	Implementation												
15K	WS Drents Overijsselse Delta	Mastenbroek Zwarte Meer					Preliminary study	Planning		Implementation						
34R	WS Drents Overijsselse Delta	Keersluis Zwolle			Preliminary study		Planning		Implementation							
34Q	WS Drents Overijsselse Delta	Mastenbroek Zwarte Water	Preliminary study	Planning		Implementation										
34AR + 34AS	WS Drents Overijsselse Delta	Vecht-Oost								Preliminary study	Planning		Phase not scheduled			
34AL + 34AM	WS Drents Overijsselse Delta	Vecht Zwartewaterland								Preliminary study	Planning		Phase not scheduled			
28F+28G	WS Fryslan	Koehool- Lauwersmeer	Implementation													
28E	WS Fryslan	Zurich-Koehool			Preliminary study		Planning		Implementation							
28A	WS Fryslan	Dijk- en duinversterking Schiermonnikoog	Preliminary study	Planning		Implementation										
16E	WS Hollandse Delta	Zettingsvloeiing V3T	Implementation													
16M	WS Hollandse Delta	Geervliet - Hekelingen 20-3	Planning	Implementation												
16P	WS Hollandse Delta	17-3 Oostmolendijk Ringdijk	Preliminary study	Planning		Implementation										
	WS Hollandse Delta	20-2 Brielse Maasdijk			Preliminary study	Fast Lane	Planning		Implementation							

Legend: Preliminary study Planning Implementation Fast Lane Phase not scheduled



Table 1.2 Programming of measures for Flood Protection Programme 2023-2028/2034

Code	Management Authority	Project name	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
17D	WS Hunze en Aa's	Kerkhovenpolder - Duitsland LRT3														
23B	WS Limburg	Alexanderhaven AB														
60AJ	WS Limburg	Roermond Traject 76-1 deeltraject Zuid														
18D	WS Noorderzijlvest	Lauwersmeer - Vierhuizergat														
21AT	WS Rijn en IJssel	Westervoort - Pannerdense Waard														
21AU	WS Rijn en IJssel	Tolkamer - Pannerdense Waard														
21AV	WS Rijn en IJssel	Tolkamer - Spijk														
21AW+21AX	WS Rijn en IJssel	Den Elterweg – Zutphen														
21AM	WS Rijn en IJssel	Westervoort - Doesburg														
	WS Rijn en IJssel	Bingerden-Doesburg														
	WS Rijn en IJssel	Lathumsedijk														
	WS Rijn en IJssel	Zuidzijde Oude IJssel														
	WS Rijn en IJssel	Doesburg-Bevermeer														
21AQ	WS Rijn en IJssel	Deelproject II Doesburg Rha														
22BV	WS Rivierenland	Wolferen-Sprok - De Stelt														
22L	WS Rivierenland	Wolferen-Sprok incl. DTO														
22X	WS Rivierenland	Gorinchem-Waardenburg (GoWa)														
22Y	WS Rivierenland	Tiel - Waardenburg (TiWa)														
22D	WS Rivierenland	Neder-Betuwe														
22AW+AU	WS Rivierenland	Sprok-Sterreschans-Heteren														
22BX	WS Rivierenland	Sprok-Sterreschans-Heteren Kruising A15														
22AR en 22AK	WS Rivierenland	Streekkerk Ameide Fort Everdingen (SAFE)														
22K	WS Rivierenland	Stad Tiel excl Fluvia														
24AG (24AV-24AM)	WS Scheldestromen	Zuid-Beveland West, Westerschelde Hansweert														

Legend: ■ Preliminary study ■ Planning ■ Implementation ■ Fast Lane ■ Phase not scheduled



Table 1.2 Programming of measures for Flood Protection Programme 2023-2028/2034

Code	Management Authority	Project name	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
24AH+24AN	WS Scheldestromen	Zuid-Beveland West, Westerschelde S2	■	■	■	■	■	■	■	■						
24AO	WS Scheldestromen	Zuid-Beveland West, Westerschelde S3	■	■	■	■	■	■	■	■						
24AB	WS Scheldestromen	Emanuelpolder														
24AE	WS Scheldestromen	Zuid-Beveland Oost, Oosterschelde							■	■	■	■	■			
24R	WS Scheldestromen	Zuid-Beveland Oost, Westerschelde	■	■	■	■	■	■	■	■						
25L	WS Vallei en Veluwe	Noordelijke Randmeerdijk (incl WDOD)														
25K	WS Vallei en Veluwe	Apeldoorns Kanaal														
25P	WS Vallei en Veluwe	Grebbedijk	■	■	■	■	■									
27C	WS Zuiderzeeland	Kunstwerken Noordoostpolder	■	■	■	■										
27D	WS Zuiderzeeland	Zuidermeerdijk-MSNF	■	■	■	■	■									
27E	WS Zuiderzeeland	IJsselmeerdijk	■	■	■	■	■	■								
27G	WS Zuiderzeeland	Oostvaardersdijk					■	■	■	■	■	■	■	■	■	■
Totaal Reguliere projecten																

Legend: ■ Preliminary study ■ Planning ■ Implementation ■ Fast Lane ■ Phase not scheduled



Table B1.3 Measures in Meuse Administrative Agreement

Code	Management Authority	Project name	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
60AI	WS Limburg	Willem Alexanderhaven C (23C)	Implementation	Implementation	Implementation	Implementation										
60B	WS Limburg	Steyl-Maashoek (19D)	Implementation	Implementation	Implementation	Implementation										
60D	WS Limburg	Thorn (19H)	Planning	Planning	Fast Lane	Implementation	Implementation									
60E	WS Limburg	Heel (19I)	Implementation													
60F	WS Limburg	Arcen (19J)	Planning	Implementation	Implementation	Implementation										
60G	WS Limburg	Well (19K)	Planning	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
60H	WS Limburg	Venlo Velden (19L)	Preliminary study	Preliminary study	Planning	Planning	Planning	Planning	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
60I	WS Limburg	Baarlo (19M)	Planning	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
60J	WS Limburg	Nieuw-Bergen (19N)	Implementation	Implementation	Implementation	Implementation										
60K	WS Limburg	Buggenum (19O)	Planning	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation
60L	WS Limburg	Beesel (19P)	Implementation													
60M	WS Limburg	Belfeld (19Q)	Implementation	Implementation	Implementation	Implementation										
60N	WS Limburg	Kessel (19R)														
60O	WS Limburg	Blerick-Groot Boller (19S)	Preliminary study	Planning	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation	Implementation

Legend: Preliminary study Planning Implementation Fast Lane



Table B1.4 Pre-financing

Code	Management Authority	Project name	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
03AA	HH Hollands Noorderkwartier	Katwoude	Implementation														
03AB	HH Hollands Noorderkwartier	Volendam (Zuideinde)															
03AC	HH Hollands Noorderkwartier	Monnickendam Binnenstedelijk	Planning	Implementation													
03AD	HH Hollands Noorderkwartier	Monnickendam Zeedijk	Planning	Implementation													
03AE	HH Hollands Noorderkwartier	Schellingwoude	Preliminary study	Implementation	Planning	Implementation											
14A	WS Brabantse Delta	Geertruidenberg en Amertak	Planning	Implementation													
14D	WS Brabantse Delta	Willemstad - Noordschans	Preliminary study	Planning	Implementation												
60AE	WS Limburg	Lob van Gennep	Planning	Implementation													
60AF	WS Limburg	Venlo 't Bat	Planning	Implementation													
21I	WS Rijn en IJssel	IJsselpaviljoen Zutphen						Fast Lane									
21A	WS Rijn en IJssel	Rijnkade Arnhem	Implementation	Implementation			Fast Lane										
21E	WS Rijn en IJssel	Industrieterrein Grutbroek	Implementation														
24AK	WS Scheldestromen	Sint Annaland	Implementation														
24AX	WS Scheldestromen	Kop van Ossensisse									Preliminary study	Planning	Implementation				

Legend: Preliminary study Planning Implementation Fast Lane



Table 1.5 Funding transfer, room for the river - dike upgrades

Code	Management Authority	Project name	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
06K	HH van Schieland en de Krimpenerwaard	Faalkansreductie Hollandse IJsselkering uit project KIJK														
13D	WS Aa en Maas	Meanderende Maas bijdrage uit project Ravenstein - Lith														
13K	WS Aa en Maas	Meanderende Maas bijdrage uit project Cuijk - Ravenstein														
13H	WS Aa en Maas	Meanderende Maas bijdrage uit project Boxmeer - Cuijk														
13H	WS Aa en Maas	Oeffelt bijdrage uit Boxmeer - Cuijk														
60G	WS Limburg	Oeffelt bijdrage uit Dijkversterking Tranche 3														
60G	WS Limburg	Meanderende Maas bijdrage bijdrage uit (Dijkversterking Tranche 3 / Well)														
	WS Limburg	Uitwisselingsbijdrage Lob van Gennepe														
21AI	WS Rijn en IJssel	IJsselpoort fase 1, uitwisseling dijktraject 48-1														

Legend: ■ Implementation

Table B1.6 Multi-Year Programme for Infrastructure, Space and Transport (MIRT)

Code	Management Authority	Project name	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
60D	WS Limburg	MIRT Thorn (19H)														
60F	WS Limburg	MIRT Arcen (19J)														
60G	WS Limburg	MIRT Well (19K)														
60H	WS Limburg	MIRT Venlo Velden (19L)														
60I	WS Limburg	MIRT Baarlo (19M)														

Legend: ■ Preliminary study ■ Planning ■ Implementation



Table B1.7 Rijkswaterstaat

Code	Management Authority	Project name	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
80L	Rijkswaterstaat	Marken	Implementation														
80F	Rijkswaterstaat	Overbuggingsmaatregelen Oostsluis Weurt					Implementation	Implementation									
80F	Rijkswaterstaat	IJmuiden Dijk	Planning	Implementation	Implementation	Implementation	Implementation										
	Rijkswaterstaat	IJmuiden kunstwerken			Implementation	Implementation	Implementation										
80K	Rijkswaterstaat	SVK Hollandse IJsselkering (schuif)															
80G	Rijkswaterstaat	Vlieland Waddendijk	Implementation														
	Rijkswaterstaat	Voorhavendijken Noordelijke Lekdijk (bestuursovk HDSR)	Implementation														
	Rijkswaterstaat	Keerschuif Prs. Marijkesluis															

Legend: ■ Planning ■ Implementation

Annex 2 Programming tables for Freshwater Delta Plan

Table B2.1 Programming of measures in Freshwater Delta Plan, second phase

High-Lying Areas with Sandy Soils (North, East & South)	DF total (mln)	2022	2023	2024	2025	2026	2027
Implementation programme, High-Lying Areas with Sandy Soils Northern Netherlands High	15.15						
Implementation programme, High-Lying Areas with Sandy Soils, East	50.00						
Implementation programme, High-Lying Areas with Sandy Soils, South (Noord-Brabant)	27.70						
Implementation programme, High-Lying Areas with Sandy Soils, South (Limburg)	22.30						
<hr/>							
Northern Netherlands Low	DF total (mln)	2022	2023	2024	2025	2026	2027
Onderzoek anti-verziltingsmaatregelen Sluis Harlingen	0.025						
Uitbreiding aanvoercapaciteit van kanalen en gemalen naar de oostelijke hoger gelegen regio's Hunze en Aa's en Vechtstromen en DOD	0.05						
Verbetering infrastructuur Noordkop	0.5						
Proeftuin landbouwprojecten: Zoete toekomst Texel (2e fase)	0.2						
Proeftuin landbouwprojecten: Experiment alternatief grondgebruik laag gelegen veengebieden	0.125						
Proeftuin landbouwprojecten: Vervolg Spaarwater Flevoland	0.1						
Proeftuin landbouwprojecten: Stimuleren implementatie Spaarwatermaatregelen + Boeren-Meten-Water	0.15						
FRESHEM-NL	3.9						
Onderzoek: Watervraag en opslagwater door industrie (meerdere projecten: Noord-Holland en Groningen)	0.1						
Ondergrondse drinkwateropslag (pilot + uitvoering)	1.5						
Hergebruik RWZI effluent Garmerwolde)	3.1						
Beekherstel en herprofilering leggerwaterlopen: Inrichting Beekdal Linde	1.1						
Beekherstel en herprofilering leggerwaterlopen: Inrichting Beekdal Koningsdiep	1.1						
Beekherstel en herprofilering leggerwaterlopen: Beekherstel Hunze en Drentsche AA	5.6						
Proeftuin landbouwprojecten: Salfar	0.625						
Proeftuin landbouwprojecten: Zoet op Zout Lauwersmeer	0.6						

Legend: ■ Implementation ■ Innovation ■ Fast Lane

**Table B2.1 Programming of measures in Freshwater Delta Plan, second phase**

River Area	DF total (mln)	2022	2023	2024	2025	2026	2027
Verplaatsing inlaat Alblasserwaard	0.8						
Vergroten van de wateraanvoer Bloemers/Ufford	0.176						
Aanpassing gemaal de Pannerling	0.78						
Main Water System							
Main Water System	DF total (mln)	2022	2023	2024	2025	2026	2027
Waterbesparende maatregelen sluiscomplexen Maas	6.70						
Internationale samenw. Stroomgebied Maas en Roer	0.35						
Voortzetting Slim Watermanagement en beheer	18.30						
KZH opdracht materieel (IK interne kosten gedeelte) KZH opdracht personeel (EPK gedeelte)	7.17						
Beheer maatregelen vergroten debied stuw Hagestein besparen drinkwater	0.53						
Maatregelen beperken verzilting spuisluisen Den Oever	15.40						
Pré-verkenning integrale aanpak verzilting sluizen Kornweerderzand	0.37						
Flexibilisering stuwprogramma Driel	0.49						
Vergroten robuustheid wateraanvoer Twentekanal (eefde)	2.30						
Ontwikkelen BOS voor Rijntakken inc. Verzilting	1.70						
Verkennen monitoring extra meetpunten	1.50						
Verkennen planuitwerking tegen verzilting kanaal Gent-Terneuzen	1.40						
Maatregelen beperken verzilting zeescheepsluizen Delfzijl	1.20						
Realisatie twee waterbergingslocaties in laagtes Maaswerken	1.50						

Legend: ■ Implementation ■ Innovation ■ Fast Lane

**Table B2.1 Programming of measures in Freshwater Delta Plan, second phase**

Western Netherlands	DF total (mln)	2022	2023	2024	2025	2026	2027
Doorvoer Krimpenerwaard	7.5						
Vervolmaatregel Brielse Meer	0.2						
Inlaatwerk Kromme Rijn	5						
Beter benutten Bergsluis	1.4						
COASTAR pilot brakwaterwinning kust(duinen)	0.6						
COASTAR pilot Rotterdam	0.48						
Temmen brakke kwel	2						
COASTAR pilot Westland	0.75						
COASTAR pilot brakwaterwinning polders (droogmakerij)	1.05						
Harnaschpolder (Delfland), hergebruik voor gietwater	3.25						

Southwest Delta	DF total (mln)	2022	2023	2024	2025	2026	2027
Slim regionaal waterbeheer	2.00						
Pilots Hergebruik effluent	0.80						
Aanvoer/hergebruik effluent Zeeuws-Vlaanderen	2.30						
Uitrollen Proeftuinen	6.90						
Uitbreiden proeftuin	1.00						
Optimalisatie watersysteem	1.70						
Krekenvisie West-Brabant	2.70						
Grondwatermodellering Zeeland/West Brabant	0.40						
Ondergrondse wateropslag Wolphaartsdijk onderzoek + infiltratie	1.30						
Optimalisatie zoetwatersituatie PAN-polders West-Brabant	0.80						
Optimalisatie benutting landbouwwaterleiding	0.80						
Benutting brak grondwater voor drink- en proceswater	0.30						
Gebruik water Brabantse Wal	2.50						

Legend: ■ Implementation ■ Innovation ■ Fast Lane



Table B2.2 Forecast investments for measures in Freshwater Delta Plan, second phase

Forecast for 2027		Total	2022	2023	2024	2025	2026	2027	2028
North Netherlands High	Contribution from Regions	44,849,000	4,484,900	6,727,350	6,727,350	8,969,800	8,969,800	8,969,800	0
	Delta Fund contribution	15,151,000	3,340,549	1,456,016	1,456,016	1,941,355	1,941,355	2,229,204	2,786,505
	Total Delta Fund and Regions	60,000,000	7,825,449	8,183,366	8,183,366	10,911,155	10,911,155	11,199,004	2,786,505
Northern Netherlands Low	Contribution from Regions	48,394,000	0	9,786,500	10,649,000	10,201,000	9,297,500	8,460,000	0
	Delta Fund contribution	18,718,000	0	4,191,500	4,439,000	3,651,000	2,840,500	2,820,000	776,000
	Total Delta Fund and Regions	67,112,000	0	13,978,000	15,088,000	13,852,000	12,138,000	11,280,000	776,000
Eastern Netherlands (ZON)	Contribution from Regions	198,311,283	9,915,567	39,662,256	29,746,692	39,662,256	39,662,256	39,662,256	0
	Delta Fund contribution	50,000,000	10,640,498	4,707,309	4,707,309	6,276,411	6,276,411	7,729,806	9,662,257
	Total Delta Fund and Regions	248,311,283	20,556,065	44,369,565	34,454,001	45,938,667	45,938,667	47,392,062	9,662,257
Southern Netherlands (DHZ)	Contribution from Regions	146,772,003	26,221,440	52,645,872	15,287,568	7,754,241	7,754,241	7,754,241	29,354,400
	Delta Fund contribution	50,000,000	9,126,480	18,238,624	5,095,856	2,584,747	2,584,747	2,584,747	9,784,800
	Total Delta Fund and Regions	196,772,003	35,347,920	70,884,496	20,383,424	10,338,988	10,338,988	10,338,988	39,139,200
Main water system	Contribution from Regions	8,257,000	0	1,519,000	1,140,000	668,000	530,000	524,000	3,876,000
	Delta Fund contribution	50,416,000	739,000	4,427,000	6,940,000	6,194,000	7,454,000	13,208,000	11,454,000
	Total Delta Fund	58,673,000	739,000	5,946,000	8,080,000	6,862,000	7,984,000	13,732,000	15,330,000
Western Netherlands	Contribution from Regions	40,176,285	0	2,274,400	2,927,685	10,493,400	14,698,400	7,914,400	1,868,000
	Delta Fund contribution	22,176,095	0	914,400	1,137,495	5,459,400	8,282,400	4,514,400	1,868,000
	Total Delta Fund and Regions	62,352,380	0	3,188,800	4,065,180	15,952,800	22,980,800	12,428,800	3,736,000
Southwest Delta	Contribution from Regions	74,327,324	6,250,000	2,789,324	18,991,250	17,039,250	20,525,750	8,731,750	0
	Delta Fund contribution	22,898,333	1,250,000	1,303,333	5,863,375	5,880,375	6,523,375	2,077,875	0
	Total Delta Fund and Regions	97,225,657	7,500,000	4,092,657	24,854,625	22,919,625	27,049,125	10,809,625	0
Rivierenland	Contribution from Regions	5,272,356	0	2,872,356	600,000	1,200,000	600,000	0	0
	Delta Fund contribution	1,757,452	0	765,962	391,491	400,000	200,000	0	0
	Total Delta Fund and Regions	7,029,808	0	3,638,318	991,491	1,600,000	800,000	0	0



Overview of background documents

- A. [Response of Delta Commissioner to advisory document of the Delta Programme Signal Group dated December 2022 and summary of advisory document](#)
- B. [Letter from young people on DP2024 and response from the Delta Commissioner](#)
- C. [Advisory document from the Physical Living Environment Consultation Body and Delta Commissioner's response](#)
- D. [Freshwater Delta Programme: Progress Report 2022](#)
- E. [Spatial Adaptation Progress Report for 2022](#)
- F. [Progress in areas \(IJsselmeer area, Rhine Estuary-Drecht Towns, Southwest Delta\)](#)
- G. [Overview of Delta Commissioner's recommendations, 2019-2023](#)

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R&Z content makers (www.ravestein-zwart.nl)

Illustrations for the outlines by chapter

Renske Postma, Tekstbureau Met Andere Woorden (www.dekrachtvantaal.nl)

Karin Schwandt, Schwandt Information Design (www.schwandt.nl)

Design and coordination

VormVijf (www.vormvijf.nl)

Translation

Pete Thomas Translations

Photography

Cover: Land use follows the water system on 't Medler estate (Gelderland), January 2023: G. Harmsen, Rijn en IJssel water authority

P. 16: Flood defence and sound barrier, Zwolle, May 2023: Jos van Alphen

P. 24: Old West Greening, Akeleistraat, Rotterdam, April 2019: Arnold Verheij

P. 36: Dike with flowers, Culemborg, May 2023: Jos van Alphen

P. 42: Improving water allocation Bloemers/Ufford in Land van Maas and Waal (Gelderland), June 2023: Tineke Dijkstra

P. 48: Delta Commissioner Peter Glas and Fien Dekker of Rain(a)Way at fifth anniversary of living lab De WaterStraat in Delft, May 2023: Tineke Dijkstra

P. 54: Galgeplaat in the Eastern Scheldt (Zeeland), August 2021: Sky Pictures www.beeldbank.zeeland.nl

P. 76: Zedemuden pumping station, Zwartsluis (Overijssel), September 2020: Tineke Dijkstra



The Netherlands is a low-lying country with an abundance of water. The national Delta Programme is in place to protect the Netherlands from flooding, to safeguard adequate supplies of fresh water, and to help render the Netherlands climate-resilient and water-robust. More information about the work on our delta can be found on the website of the national Delta Programme. The Programme involves concerted efforts by the central government, the provincial and municipal authorities, and the water authorities, with active participation from research institutes, stakeholder organisations, residents, and businesses.

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NATIONAL DELTA PROGRAMME

GIVING IT
OUR ALL
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AND LIVEABLE
DELTA