Towards a future-proof river zone

Integrated River Management Programme

Start of the Programme
Room for the River 2.0

Glossary

Discharge capacity	The volume of water in m^3/s that a river can carry away. This depends on the flow profile (space in the riverbed in terms of width, height, and length) and the roughness profile (the resistance that the water flowing in the river encounters from the riverbed, vegetation, and obstacles). Changes in these factors affect the discharge capacity and water level when water levels are high.
Storage capacity	The volume of water that can be stored between the ground level (top of a terrain) or the weir level (water level regulated by a weir in a river) and the highest acceptable level.
Landward side	The land protected by the dykes on the inland side. For the Meuse valley, this includes the higher areas outside the Meuse catchment zone.
Riverbed erosion	The process of wear on the main channel in which sediment is moved or entirely carried away by the water flowing in the river, causing a deepening of the riverbed.
Water side	The retaining side of the dyke with the river forelands and river itself. For the Meuse valley, this is the Meuse river basin
Ecological water quality	Ecological status of surface water, measured in terms of biological quality, physico-chemical quality, and standards for other relevant pollutants.
Stabilized Sections	Sections of the river where the water level is determined by weirs.
Main water system	Water systems (rivers, lakes, delta, and canals) that are managed by the national government.
Hydrodynamics	Variables in quantity (duration, depth and flow conditions at different discharge levels) and quality of the river water and the substances carried in it, which affect flora and fauna.
Structures	Man-made constructions, typically not designed for habitation, serving purposes related to infrastructure or water management, such as bridges, pumping stations, locks, weirs.
Meuse works	Programme to improve the safety and navigability of the Meuse when water levels are high through dyke reinforcement and river widening projects.
Morphodynamics	Changes due to hydraulic forces exerted on sediment (erosion, transport, and deposition of sediment due to water flow, waves, and wind).
Siltation	The raising of land due to silt remaining after a flood
Flood risk approach	An approach that looks at both the risk of flooding and its consequences.
River foreland	Flat or nearly flat land adjacent to a river or stream that is covered by water when water levels are high.
Planning zone	The river zone where the tasks for the Integrated River Management (IRM)/Room for the River (RvdR) 2.0 Programme are located, and where, based on detailed zone plans, measures can be taken for these tasks.
Regional water system	A water system (canals and streams) or parts of it that are not managed by the national government.
Reservation Areas under the Quality of Living Environment Decree	Landward side reservations to ensure space for water in the long term (formerly General Spatial Planning Regulations Decree [Barro] reservations).
Sediment	Material transported by, among other things, water. Examples: gravel, clay, sand, silt, and lutum.
STEAM scenario	One of the four Delta scenarios (future visions on living, working and space use in 2050, in relation to possible impacts of climate change in the Netherlands), in addition to the 'Druk' (stressed), 'Warm' (warm), and 'Rust' (calm) scenarios.
System operating measures	System interventions in the Meuse Valley, intended to maintain the space in the riverbed and the wave flattening capacity lost due to the elimination of the overtopping requirement for the primary defences in the Meuse Valley.
Wave flattening	The slowing down and flattening of the top of a wave when water levels are high because the wave slowly flows off via a wide winter riverbed.
Sand trap	Local depression in the riverbed, in which the river deposits sediment.
Main channel (navigable area)	Part of the riverbed in which water flows all year round, and which is usually used as a waterway for shipping.

Administrative summary

Approach to river design necessary

Interventions in the river zone of the Meuse and the Rhine tributaries have been ongoing for centuries. Dykes, groynes, weirs, locks, and canals have ensured safe living, business, and recreational conditions for inhabitants, and kept the rivers navigable. A trend of riverbed erosion, among other things, in the current design of the river zone is causing problems for various river functions, and is being further aggravated by climate change. A long-term perspective is needed to guarantee that the Meuse and the Rhine tributaries continue to function well as a system, which necessitates an integrated approach.

Many requirements and ambitions have been developed through sectoral policy, which allowed all the river functions to be facilitated until now. The result of all the interventions over the course of time is that the rivers have increasingly occupied a fixed place in the landscape, which reduces the natural dynamics and ecological quality, and has caused erosion and ongoing deepening of the riverbed in some parts of the river. The problem is exacerbated by climate change, which is increasingly causing very hot, dry, and wet periods, resulting in extremely high or low river discharges. These trends are having an impact on the various river functions and characteristics of the rivers, such as discharge capacity, freshwater availability, drinking water supplies (important for food supply), navigability, good conditions for nature, ecological water quality, and spatial quality.

Due to a combination of the current river design and the more frequent extremely high or low discharges, the conditions (system characteristics) required for river functions are increasingly falling short of requirements. This concerns water levels and discharge distributions (when river discharges are high or low), erosion, and sediment management. For example, during dry periods shipping suffers at various locations, including the Waal, the Netherlands' most important waterway, while at the same time not enough water is discharged via the IJssel into the IJsselmeer area as a freshwater buffer. Other examples: the enormous task to promote nature requires space, deepening of the riverbed is causing desiccation in river forelands and the hinterland, and the major challenge in terms of water safety has to be addressed. Figure 1 (*Development map*) shows where there are multiple tasks in the river zone. Not everything fits, so doing nothing is not an option: decisions and changes have to be made. These tasks require the parties responsible for the design and management of the river zone to make choices and adopt an integrated approach with measures that are part of a logical and interconnected whole, rather than designed to address only a specific part of the problem.

With its Integrated River Management (IRM) Programme, the national government has decided that a new direction will be taken in terms of the design and management of the major rivers in the Netherlands. It is based on collaboration with provinces and water boards in the Rhine and Meuse Delta Programmes. The goal is to redesign the rivers in such a way that as many of the system characteristics as possible are achieved. As such, the IRM Programme (as an instrument of the Environment and Planning Act) forms the starting point for the Room for the River Programme 2.0 (RvdR2.0). 'IRM' thus refers to the underlying Programme and RvdR2.0 to the follow-up phase that starts after the adoption of this Programme IRM.

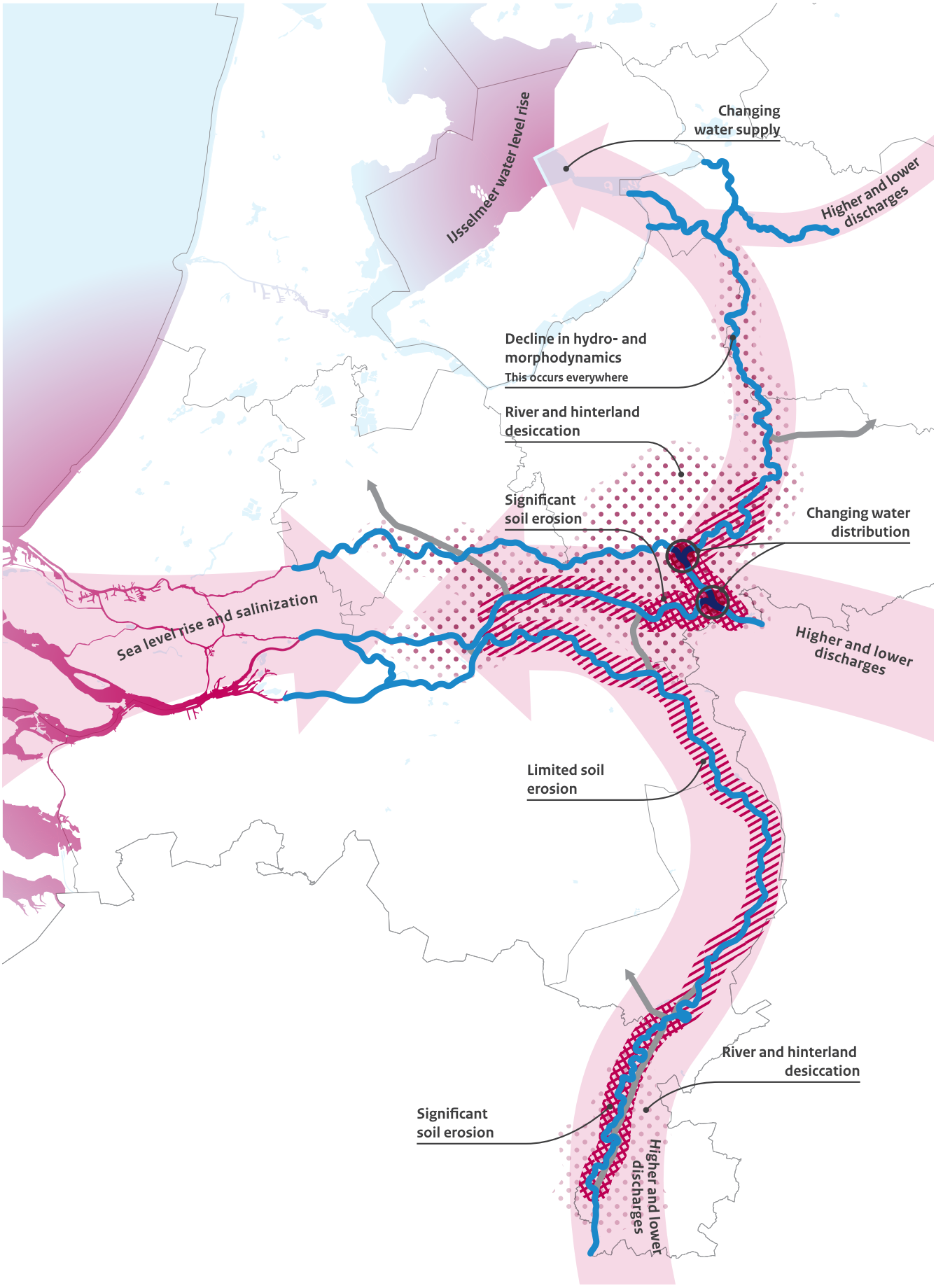
If, during the elaboration of RvdR 2.0, it turns out that not all desired system characteristics can be achieved, the possible adjustment of sectoral goals will be included in the agenda of sectoral programmes.

The purpose of the IRM Programme is to create system characteristics that facilitate various uses

The ambition of the new river policy is to create a future-proof river zone that functions well as a system, and is available for multiple purposes.

The planned future-proof river system is the combined set of physical, chemical, and biological characteristics that maintains itself hydro-morphologically and ecologically as much as possible on the basis of natural processes. The goal of the IRM Programme is to improve system characteristics so that river functions can continue to be facilitated as much as possible, and comply with national and international legislation and regulations.

Figure 1: Development map



The five river functions on which the IRM Programme focuses: (1) water discharge (for flood protection), (2) freshwater availability and drinking water supply, (3) nature and ecological water quality, (4) navigability, and (5) regional economic development and spatial quality. In the following phase, measures are elaborated with regard to the discharge and storage capacity, the riverbed level, and sediment management.

Unless interventions are carried out, the task of achieving the required system characteristics for these river functions will become more and more difficult due to riverbed erosion and climate change. This requires structural measures, so the IRM Programme sets out:

1. **Two new policy goals** regarding the physical layout of the river zone, and **two policy choices** that clarify how these goals will be attained. The policy choices are partly based on information from the environmental impact assessment (Plan EIA). Policy choices will be further elaborated in coordination with spatial policy programmes and with policy programmes related to the river system and main water system. The ongoing and planned pilot projects, such as the Gelderse Poort, Vierwaarden, IJssel-Vechtdelta, and Zuidelijk Maasdal, are already helping with the realization of these policy choices.

2. **Insight into the spatial consequences** of policy choices. It is clear that the land required to facilitate all the functions in the entire river zone exceeds the current water side area available.

3. **An adaptive approach until 2050**, which is periodically amended based on new insights into measures and developments, such as climate change and water demand. The new Climate and Delta Scenarios published in October 2023 are important recalibration documents. They will be used in the further elaboration of policy choices in the coming years. The IRM Programme is based on a six-year cycle of updating implementation strategies, parallel to the recalibration of the Delta decisions.

4. **A roadmap for RvdR 2.0**, including:
   a. What the further elaboration of the interconnected policy choices to attain the goals of the IRM Programme will look like. Intermediate results can be included in the second recalibration of the Delta Programme (in 2026). The roadmap sets out the direction of the work:
      - The following phase will be concluded with the establishment of implementation strategies for the scale levels: The Rhine tributaries, the Meuse, and the national and international scale.
      - The phase after 2026 deals with the implementation of the measures in the implementation strategies.
   b. An overview of the required interconnected insights and interim results. It is composed of studies, learning experiences, projects, and activities that contribute to the two policy choices.

The policy goals, IRM Programme policy choices, and spatial consequences

The national government has decided to pursue the following new policy goals for the river zone:

1. For the **riverbed level and sediment management**: a sufficiently stable and manageable main channel riverbed level that promotes recovery of natural river dynamics, and ensures good navigability and water distribution across the Netherlands when river discharges are low.

2. For **discharge and storage capacity**: sufficient capacity to absorb the higher river discharges expected this century, and to facilitate spatial developments, nature, riverbed levels, and other tasks.

The policy choices to attain the new goal for riverbed levels and sediment management are as follows:

1. The most urgent task is to stop the erosion of the riverbed of the Meuse and the Rhine tributaries. In addition, the eroded parts must be raised where necessary and feasible for the Rhine tributaries. For the **Meuse** and **Rhine tributaries**, the goal is to end excavations in the main channel, unless a major general interest arises, such as deepening of the navigation channel.

   In addition, efforts are being made to add sediment in the Common Meuse to stop further deepening of the riverbed. Various measures are being elaborated for the **Rhine tributaries**. In addition to ending excavations in the main channel, these include adding sediment to the eroding sections to stop further deepening of the riverbed. Besides these measures, efforts will be made in the long term to raise the riverbed where necessary and feasible.

2. To ensure sustainable sediment management and better manageability of the riverbed, the natural morphodynamics of the river will be exploited wherever possible. The aim is to maintain continuous sediment transport, and organize the rivers in such a way that dredging to maintain the waterway is reduced to a minimum. In concrete terms, the focus will be on:
   a. Returning sediment that is dredged for waterway maintenance at a location with sufficient depth (provided the dredged material is sufficiently clean for dumping back into the river).
   b. Ending excavations of the main channel, and conducting a study into the long-term conservation of main channels deepened in the past.
   c. Dimensioning interventions in the winter riverbed so that they limit riverbed erosion.

Figure 2: The Riverbed Levels and Sediment Management Task

The **policy choices to attain the new policy goal for discharge and storage capacity**:

1. The desired discharge and storage capacity is determined in phase i. Further studies will reveal, based on the five river functions, the necessary and desired long-term discharge and storage capacity of the rivers, and with which combination of interventions (dyke elevation, water side and landward side river widening) this can be attained. This involves studies into:
   a. The socially most desirable long-term discharge distribution when water levels are high in the Rhine tributaries, and the associated control range at the branching points.
   b. The effectiveness of the system operating measures in the Meuse Valley (according to the recommendations of the Policy Table on Flooding and High Water Levels *('Beleidstafel wateroverlast en hoogwater')*.
   c. The best way to attain the desired drainage and storage capacity for the IJssel-Vecht delta, taking into account storm surge from the IJsselmeer.

2. In addition to the current policy, in which a decrease in discharge and storage capacity has to be compensated, additional efforts are being made to utilize opportunities for synergies when drawing up implementation strategies and in new projects. This concerns aspects such as nature development, sparing vulnerable dyke sections, and possibilities to remove the erosive force from the system and reduce or stop ongoing riverbed erosion.

The policy choices regarding riverbed levels, sediment management and discharge, and storage capacity are intended to deal with the developments shown in the development map (Figure 1). Figure 2 *(The riverbed level and sediment management task)* shows the policy choice per route. The branching point zones are the most difficult; this is where the riverbed is at its lowest.

To help with policy choices, policy-relevant information has been compiled in the form of a Plan EIA, an Appropriate Assessment, and a cost-benefit analysis (CBA) of the key figures. To implement the policy choices, further elaboration is required as provided in phase 1 of the IRM Programme.[1]

The spatial consequences of the IRM Programme

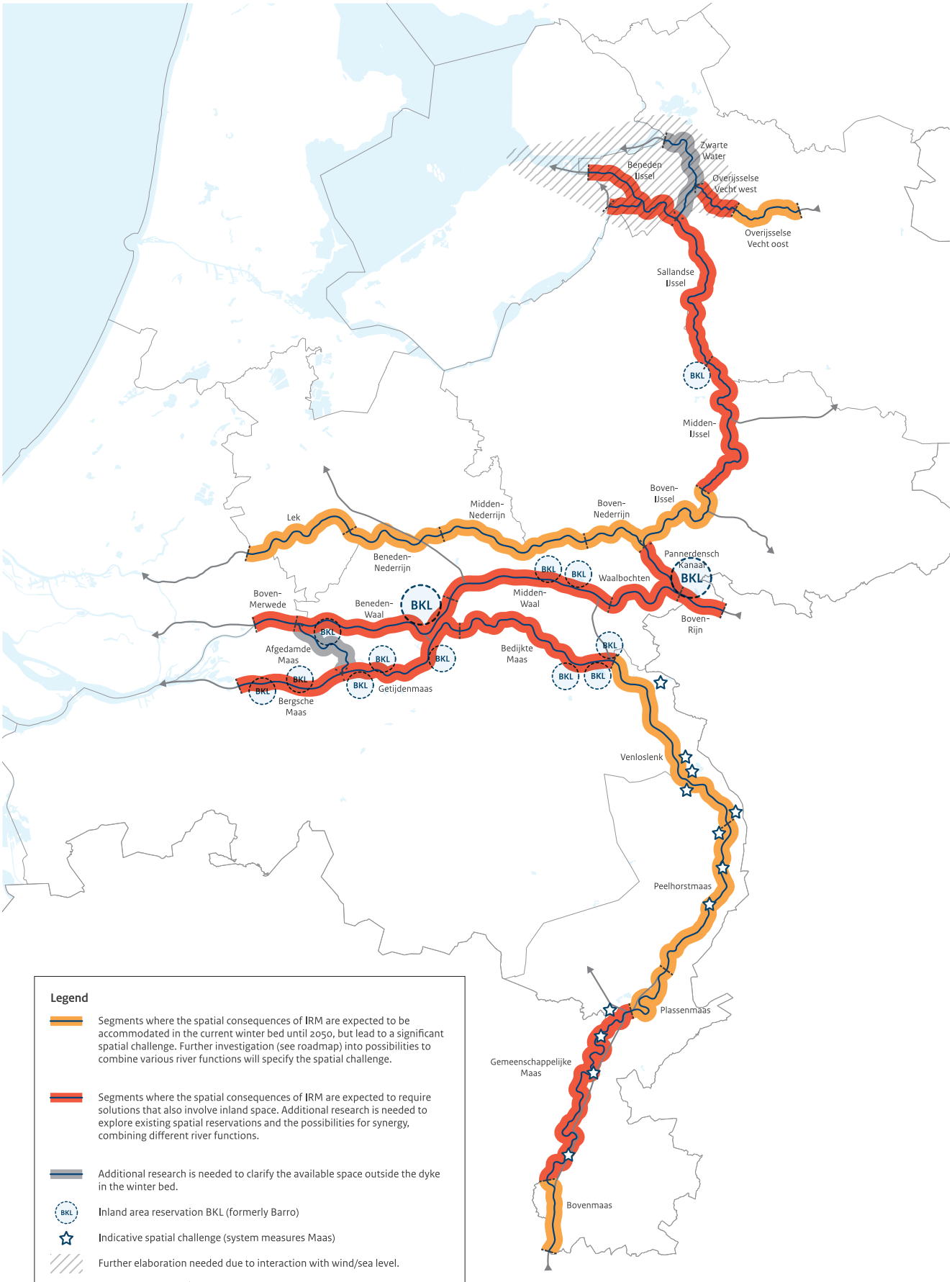
Putting the two policy choices into practice requires space. In the planning period until 2050, this can partly be found on the water side (the space currently available between the dykes). However, on a number of river stretches, space on the landward side of the dykes is also required to continue to facilitate river functions.
It is also clear that if we look ahead to 2100, the space required for the river system will be more than in 2050. For this reason, it is a good idea to reserve additional space now in addition to the space until 2050, to prevent misinvestments or restricted solutions.
The spatial consequences until 2050 are shown in Figure 3 *(Spatial consequences of policy choices up to 2050)*, This map shows the river sections where there is enough space on the water side of the dykes, although this does lead to a significant spatial task (orange). It also shows where landward side space is also expected to be needed at locations still to be determined (red).

The map is based on the space required for all the river functions. It must be emphasized that the space required for the river functions has not yet been combined/considered in conjunction with spatial consequences of other social tasks, such as urbanization and the energy transition. This will be considered in the context of the update of the National Environmental Vision (*Nationale Omgevingsvisie* - NOVI), which will produce the new Spatial Planning Policy.

The map clearly shows that it is a shared responsibility to design a future-proof river zone, and not leave the impacts of that design to be resolved in the future.

1 This elaboration is necessary, because further studies are required to develop packages of measures that match the Preferred Option of the Plan EIA.

Figure 3: Spatial consequences of policy choices until 2050



Management and cooperation

The Minister of Infrastructure and Water Management adopts the IRM Programme in consultation with the State Secretary of Agriculture, Fisheries, Food Security and Nature (LVVN) and the Minister of Housing and Spatial Planning (VRO). The Minister of Infrastructure and Water Management is the system manager for rivers, and therefore the coordinating minister for the IRM Programme, a role that will continue under RvdR 2.0.

Due to the different impacts of solutions for the different sectoral goals, some of which are at odds with each other and others of mutual benefit, it is clear that solving issues from the perspective of a single function is ineffective. It is therefore necessary to enhance cooperation between the parties that 'represent' the various river functions. This need is further reinforced by the fact that the solutions often have to be found in the same zone or sub-zone, and that some problems must be addressed promptly. This means that working together is another task of the IRM Programme, which will be addressed in RvdR 2.0. The existing cooperation and governance, in which cooperation between the various parties is already guaranteed, will therefore be continued in the coming years, with a programme organization which facilitates inter-administrative cooperation so that policy can be further detailed and its implementation organized.

The collaborative task can lead to the further development of collaboration and governance.

Collaboration is at a national level between those responsible for policy for the various sectoral programmes. The national government will also collaborate with regional parties, mainly on setting up and implementing projects that realize system characteristics that serve as many river functions as possible, and at the same time meet obligations under Dutch and international law.

The collaborative task can lead to the further development of collaboration and governance.

Relationship with other programmes

The relationship between the RvdR 2.0 Programme and other programmes is based on the principle that the parties work on attaining the goals established in the IRM Programme, and the policy goals of the relevant programmes through sectoral programmes (related to the various river functions). This applies, among other things, to the Programmatic Approach to Large Water Bodies (*Programmatische Aanpak Grote Wateren* - PAGW), the High Water Level Protection Programme (*Hoogwaterbeschermingsprogramma* - HWBP), the Freshwater Delta Programme (*Deltaprogramma Zoetwater*), and area-specific Delta Programmes. In the context of the RvdR 2.0 Programme, the national government is investigating how the river zone should be organized to ensure that the river functions as well as possible on the one hand, and to attain the policy goals of the more sectoral programmes on the other. No tasks or authorities will be transferred from these other programmes to the RvdR 2.0 Programme organization. Decisions on sectoral goals are therefore not the responsibility of the RvdR 2.0 Programme, but the administrative platforms/steering groups of the relevant programmes, whereby the impacts on other goals in the river zone are considered by addressing them upfront in the context of the RvdR 2.0 Programme. However, it is possible that the RvdR 2.0 Programme may initiate the agenda in sectoral programmes regarding potential adjustments to sectoral goals, as goals may not be simultaneously attainable and/or required system characteristics may not be able to make a sufficient and timely contribute to the sectoral goals.

Colophon

The **Integrated River Management Programme** is a publication of the Ministry of Infrastructure and Water Management (IenW, coordinating ministry), the Ministry of Agriculture, Fisheries, Food Security and Nature (LVVN), and the Ministry of Housing and Spatial Planning (VRO) in collaboration with the Meuse and Rhine Delta Programmes, Rijkswaterstaat, and the Delta Commissioner staff.

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