Sound strategies to reduce flood risk
Flooding is one of the most damaging and frequent disasters, having a profound impact on people all over the world. And climate change is expected to make things even worse. Over the past decade alone, more than one hundred major floods occurred worldwide, causing loss of life and severe social, economic and ecological damage. What can you do about it?

The probability and impact of flooding vary over time, and only effective flood risk management strategies can minimize them. But defining the right strategy is not easy. A sound strategy requires an integrated approach, one that aims at minimizing flood risk, but also maximizing economic, social and environmental sustainability. In a successful strategy, there is continuous focus on the key beneficiaries and potential funding sources. This approach will provide you with a comprehensive understanding of flood risk reduction that can be affordably implemented and adds value to society.

Manage your flood risks
Royal HaskoningDHV offers you services that cover the entire flood risk management cycle, from concept to feasibility, impact assessments, design, tender process, site supervision, and operation & maintenance. Specifically, our product offering includes:

- Integrated Flood Risk Management Plans
- Safety Level and Flood Risk Assessments
- Protection Criteria Development
- Stakeholder Involvement and Capacity Building
- Hydraulic & Hydrological Modelling
- Design of Structural Measures
- Monitoring and Early-Warning Measures
- Environmental and Social Impact Assessments
- Development of methods, tools and guidance
- Economic justification and business cases
Flood risk management: an obligation and a challenge
Feeling the obligation to minimise flood risks and effectively taking up the challenge are two different things. Where do you start? What are the administrative and legislative constraints? Is it only your problem or does the scale mean others are affected? Will your solution become your neighbour’s problem? What are the options? What are the stakeholders’ priorities?

Royal HaskoningDHV helps you be prepared
The need for an integrated approach to flood risk management was again demonstrated by the recent disasters caused by hurricane Katrina (USA), cyclone Nargis (Myanmar) and the Asian tsunami. The countries affected were not prepared for the disasters, as a result there was immense human suffering, loss of lives, economic damage and social disruption.

Flood damage tends to be highest in delta areas, since that is where both population and economic activities are usually concentrated. Flood risk reduction solutions in these areas should therefore focus on cities. Attention should also be paid to the benefit of surrounding areas like wetlands in flood risk management (‘building with nature’). The influence of climate change, deforestation and erosion, and subsidence means that flooding is not only a threat to the traditional “flood-prone” areas. This is why flood risk management is a cycle in which we need to continuously anticipate to changing conditions, and widen our project and planning horizons. Becoming fully prepared in such a complex context requires teamwork involving the client, professional experts and stakeholders. In this way, you can ensure a complete and seamless integration of all your flood risk management measures with land use and other economic, social and environmental functions.

We recognise complexity but keep it simple
Thanks to our knowledge, experience and network we can offer you tailor-made integrated solutions:

- We operate worldwide and master the techniques and state of the art.
- We know the opportunities and risks.
- We work with a regional focus from local offices, in collaboration with local companies and institutions.
- We know the setting, country specifics and context.
- We collaborate with internationally renowned water research institutes and universities.
- We are up-to-date on the latest developments in research and innovations.

Our approach, with the involvement of international and local expertise, also guarantees continuity in your projects.
Room for the River Waal, the Netherlands

Following river flood events in 1993 and 1995, the government of the Netherlands initiated its “Room for the River” programme with the objective of preventing flooding by creating more space for the country’s rivers at 40 locations. One of the main locations is the city centre of Nijmegen, where the River Waal, the largest river in the Netherlands, flows in a narrow bend. For the city of Nijmegen, making room for the river means replacing the dike at Lent and constructing a secondary channel in the Waal’s flood plains. This will result in the formation of a new river island and a unique river park in the heart of Nijmegen. New space will be created where people can live and enjoy recreational and cultural activities, benefiting from the water and nature. The municipality was supported by a consortium led by Royal HaskoningDHV in developing a plan for this “Room for the River Waal” project.

Royal HaskoningDHV is responsible for developing several use scenarios for the land created by the dike replacement. The project encompasses the design, Environmental Impact Assessment, engineering and approvals elements.

Flood protection for industry, Thailand

The floods that struck Thailand in 2011 showed how serious the impact of such events can be for industrial and commercial facilities. The floods were in fact the costliest in the country’s history. In the aftermath, numerous companies decided to take flood risk reduction measures to protect their facilities in the future.

Royal HaskoningDHV partnered with our Thai subsidiary, Chuchawal Royal Haskoning, to advise various private clients on their flood risk level and to design appropriate flood risk reduction measures. The combination of local Thai expertise and Dutch engineering proved very successful. The team came up with high-quality and affordable solutions. The design process included field visits and discussions with the clients, which allowed for a solid assessment of the situation. On this basis, integrated, customised solutions were proposed as well as sound justifications for the required investment.

Moray Flood Alleviation, Scotland

Moray Flood Alleviation, in northeast Scotland, is one of the largest projects of its type in the UK. Its total estimated costs are £180 million and it will reduce risk to 3,000 properties. Royal HaskoningDHV works in an integrated team with the client, cost consultant and contractor to alleviate flood risk for 4 communities, in response to devastating floods during the 1990s and 2000s. The works include flood storage dams and reservoirs, walls and embankments, channel widening, bridges, demolition of property and reconstruction of highways. The project is an example of working within communities and finding integrated solutions.
Revising risk reduction system in New Orleans following 2005 hurricanes, USA

The Hurricane Storm and Damage Risk Reduction System (HSDRRS) around the US city of New Orleans was significantly revised after the flood disasters caused by hurricanes Katrina and Rita in 2005. The entire system has been re-designed and new closure structures have been built to protect the city against hurricane threats in the future.

In 2006 Royal HaskoningDHV joined a consortium that provided project management services for the programme. Our role was to contribute technical expertise in a variety of fields, including modelling practices, design levels, waves, levee design and evaluation, coastal engineering, armouring and GIS. The work incorporated many innovative approaches, concepts and technologies. For example, we developed and implemented a novel probabilistic method to determine the levee and floodwall elevations.

Royal HaskoningDHV also developed the innovative Hurricane Surge Atlas, which helps emergency managers to make a quick and efficient assessment of expected storm surge levels associated with approaching hurricanes.

St. Petersburg Flood Protection Barrier: feasibility, project management, design and construction supervision, Russia

To protect St. Petersburg, a Flood Protection Barrier has been built at the mouth of the River Neva. The 22 km barrier consists of 4 dam sections, 6 discharge sluice complexes and 2 navigation passes with giant flood gates (the largest is 200 m wide and 22 m high). The construction activities began in the 1970s, but were stopped in 1990s due to environmental concerns. Once these concerns were addressed, activities resumed in 2004 and were virtually completed by August 2011.

Both Royal Haskoning and DHV, when they were separate entities, were intensively involved in the different stages of the project. In 2002-2003, Royal Haskoning produced a project feasibility study and Environmental Impact Assessment. The study recommended completion of the project generally in line with the original design, but called for certain essential modifications to its principal component, that is, the main navigation pass for seagoing traffic.

DHV was one of the main members of the consortium commissioned in 2003 by the Russian government to review the old design and prepare a revised design and Design & Build contract documents, and to carry out the construction supervision. Between 2004 and the project’s completion in 2011, Royal Haskoning was involved in project management and construction supervision for the client.
Royal HaskoningDHV is an independent, international engineering and project management consultancy with more than 130 years of experience. Its head office is in the Netherlands, other principal offices are in the United Kingdom, South Africa, and India. We also have established offices in Indonesia, Thailand and the Americas; and we have a long-standing presence in Africa and the Middle East.

Backed by the expertise and experience of 7,000 colleagues all over the world, our professionals combine global expertise with local knowledge to deliver a multidisciplinary range of professional engineering and project management consultancy services in aviation, buildings, infrastructure, industry, energy and mining, planning and strategy, transport and asset management, rivers, deltas and coasts, and water technology all over the world from 100 offices in 35 countries.

By showing leadership in sustainable development and innovation, together with our clients, we are working to become part of the solution to a more sustainable society now and into the future.

Today, the company ranks in the top 50 of engineering companies worldwide and in the top 15 of Europe.

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