

Discussion support system for long-term flood risk management in the Netherlands

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Introduction

Making decisions about long-term planning for flood risk management is recognized as a complex activity, because of uncertain developments in climate, economy and demography and the many actors are usually involved in making strategic choices. A discussion support system (DSS) could enhance the communication between these actors, by ensuring a common understanding of the problem and by structuring the large amount of information.

Two prototype DSSs have been developed and tested among potential end-users. The DSSs show the long-term effect on flood risk of the current flood risk management strategy, under different future scenarios as well as the effect of alternative strategies. The system allows different users to develop their preferred strategy as a combination of measures. The effect on the future flood risk is directly shown. In addition, costs and indirect effects such as on nature can be evaluated. The additional value of a DSS is that the user learns about the concept of flood risk by playing with combinations of for example dike raising and spatial planning.

DSS functionality

The following procedure is followed by the user of the DSS:

1. Explore the future
How will the flood risk system change during the next century? The future (0-100 years ahead) is envisaged by scenarios that represent autonomous developments that cannot be influenced by the flood risk manager, such as sea level rise, economic growth and population growth. To support this exploration, the results of model calculations are stored in a database. This enhances a quick response to choices made by the user. These developments have an impact on the future flood probability, economic risk and casualty risk.
2. Choose your strategy
What can be done to reduce the current and future flood risk? Compare strategies and assess the effect against criteria such as cost/benefit ratio, societal risk, environmental impact, etc.
3. Discuss your findings
After exploring the future, the user will have insight in the concept of flood risk and the effect of different types of measures. Other users will have a different perspective on the preferred strategy (combination of measures). This third DSS component allows for a discussion between stakeholders, by comparing the combined effect of scenarios and strategies.

DSS applications

Two prototype DSSs have recently been developed:

- For the Schelde Estuary, under the framework of the European FLOODsite project (Gahey et al. 2008) (Figure 1);
- For the Netherlands, under the framework of the Dutch Water Safety 21st century project (Klis and Dijkman 2005) (Figure 2).

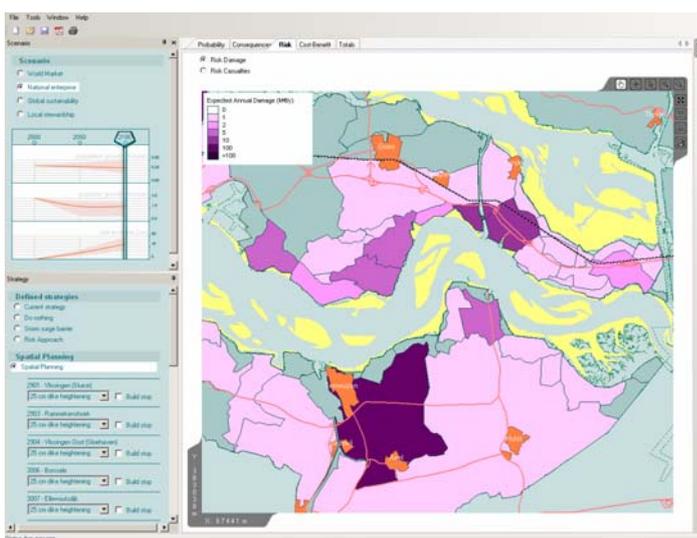


Figure 1. Screenshot of DSS for the Schelde: scenarios are shown in the upper-left corner, strategies on the lower-left and the effect on expected annual damage (per subarea) on the right

Conclusion

A first workshop with end-users showed that the DSS-concept is appreciated by a broad audience and that a high level of insight is reached. Using the DSS for the purpose of comparing safety standards was considered possible. This is promising in the context of the current political discussion about flood safety standards in the Netherlands.

In the coming years the prototype of WV21 will be further developed in close cooperation with the end-users (Ministry, provinces, water boards, etc.). An annual update of the system will ensure that the societal discussion about flood protection levels in the Netherlands

is based on the latest scientific information about flooding probabilities, flooding impacts, climate change scenarios, socio-economic development scenarios and alternative measures and their effects.

References

- Gahey, C. M., Luther, J., Mens, M., Petroschka, M., Sayers, P., Schanze, J., and Walz, U. (2008). Methodology for a DSS to support long-term flood risk management planning. FLOODsite.
- Klis, H. v. d., and Dijkman, J. (2005). Haalbaarheidsstudie hulpmiddel veiligheidsdiscussie: Blokkendoos WV21. WL Delft Hydraulics, Delft.

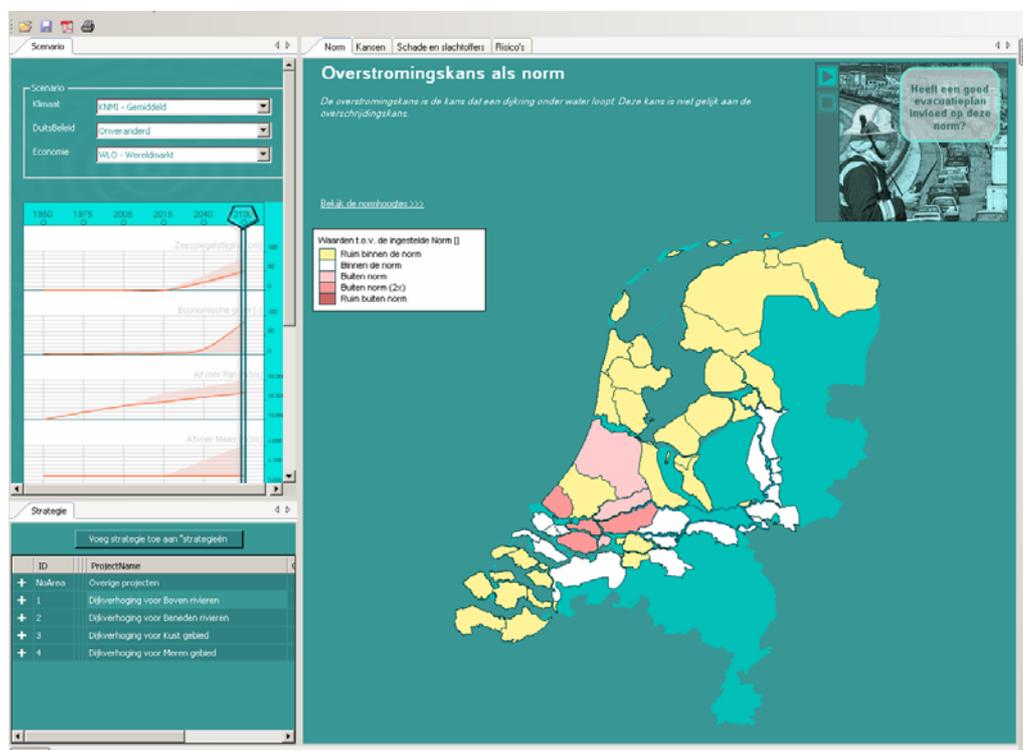


Figure 2. Screenshot of DSS for the Netherlands: scenarios are shown in the upper-left corner, strategies on the lower-left and the effect on safety standards on the right