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

M.J.P. Mens

Deltares, P.O.Box 177, 2600 MH Delft; marjolein.mens@deltares.nl

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.

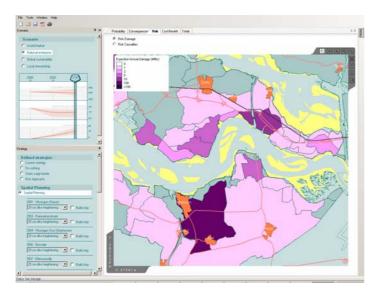


Figure 1. Screendump of DSS for the Schelde: scenarios are shown in the upperleft corner, strategies on the lower-left and the effect on expected annual damage (per subarea) on the right

DSS functionality

risk.

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
- 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).

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. Screendump 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