

## Session DD 5.2: Generating and evaluating potential solutions

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<b>Keynote speaker</b>	Prof. dr. Peter Verburg, Institute for Environmental Studies, the Netherlands
<b>Speakers</b>	Prof. dr. Han Meyer, Delft University of Technology, the Netherlands Wim van der Knaap, Wageningen University, the Netherlands Geoff Darch, Atkins, United Kingdom MSc. Karina Czapiewska, DeltaSync, the Netherlands Dr. Claire Vos, Alterra Wageningen UR, the Netherlands Msc. Gerard Jan Ellen, Deltares, the Netherlands Robert Barker, Baca Architects, United Kingdom Karin Thomas, Thomas Consulting/Tilburg University, the Netherlands
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Land use plays a central role in climate adaptation, since land use can cause climate change and climate change impacts on land use. Climate change influences the vulnerability of the area and adaptation measures are strongly related with land use planning. The effects of land use on flood related risks can be found at a local scale; at larger scales the effect is quite small. Apart from its hydrological effect, land use changes also the vulnerability for floods. The damage of an event will increase as a result of urbanization.

Land use planning also plays an important role in adaptation measures. Spatial planning can for example introduce vulnerable zones, water retention areas and create safe places. In a multifunctional landscape ecosystem services are important instruments to a climate proof landscape. Society pays for ecosystem services taken by land owners.

Science is important in assessing the risks in terms of chances and damage and to define adaptation measures and their effects. Use existing “building blocks” to link models and methods. Don’t build a one size fits all model, because the knowledge of the system will be lost.

Wim van der Knaap shows the aspect of time in climate change problems. These time aspects play an important role. Society may change more rapidly than the climate. An example is how society is affected by the introduction of the mobile phone. In planning and design one should deal with time aspects, for example procedures (length, sequence and frequency of actions), life cycle and resilience should be placed in the context of time.

Although Delta’s have much in common they also are very different. After Katrina the United States and the Dutch started the project Delta Dialogues. The project looked at the similarities and differences between the Rhine and Mississippi Delta and what can be learned from the water safety approach in the Netherlands and in the USA. Although the measures can be very different, it is in both systems very important to pay attention to the interaction between different spatial scales, different planning layers (examples soil/hydrology, infrastructure, urbanization) and to involve governments at local, regional and national level.

Climate change has a huge impact on nature. The nature adaptation strategy has three pillars. Firstly increase connectivity by enlarging and linking ecological networks. Secondly increase the heterogeneity of nature area’s and the surrounding landscapes. And finally improve the abiotic conditions and facilitate natural processes. In the Netherlands this strategy has been made concrete for wetland-, forest-, heather- and coastal ecosystems. Local landscapes play a role in the implementation. Ecosystem services can stimulate elements in the landscape that improve the connectivity between nature areas.

In England the coastal area is vulnerable to sea level rise. The Lincolnshire area is one of the most productive agricultural areas and some towns have significant flood risks. Hazard maps of the area are developed.

Together with stakeholders principles to reduce flood risks are defined. Development in the most vulnerable area's is restricted to business related investments (tourism, farming). Urban development is restricted to the areas with low risks. The hazard maps showed to be an important instrument for stakeholder participation.

Climate change offers also new opportunities to society. Extra water brings interesting new possibilities for public transport. Transport speed is limited in small water ways. Water busses need large surface water areas. Climate change may also stimulate innovative ways of multifunctional planning, such as interwoven urban and rural functions. Another example is the area around Little Hampton. This city can build a climate robust new area. This can only be profitable when the development of new residential areas is funding the development of the area. The last example is the city of Borth along the British coast. Probably a new reef can provide safety and surfing opportunities.