



# DELTA IN TIMES OF CLIMATE CHANGE II

## INTERNATIONAL CONFERENCE

OPPORTUNITIES FOR PEOPLE, SCIENCE, CITIES AND BUSINESS  
 ROTTERDAM THE NETHERLANDS, 24-26 SEPTEMBER 2014

Deltas in Practice, policy-practice sessions	
Deltas in Practice Theme 2. Adaptation strategies	
DP 2.9 Decision making in an uncertain world	
Chair	Stéphane Hallegatte, The World Bank, USA
Organised by	Stéphane Hallegatte, The World Bank, USA Maarten van Aalst, Line van Kesteren, Red Cross Climate Centre, the Netherlands
Presentations	<ul style="list-style-type: none"> <li>• Stéphane Hallegatte, The World Bank, USA</li> <li>• Maarten van Aalst, Red Cross Climate Centre, the Netherlands</li> </ul>
Session topic	<ul style="list-style-type: none"> <li>• Robust decision making under deep uncertainty</li> </ul>
Objective of the session	<ul style="list-style-type: none"> <li>• Experience the influence of uncertainty in decision-making, with the use of a serious game</li> </ul>
Main conclusions and lessons learnt from the presentations	
<p>A game is played in this session. In the game, every participant plays a governor of his own province. Groups of three provinces form a nation. Governors have to decide whether they put the limited amount of money (beans) on flood defence, economic investments or drought protection. On national level three governors have to decide together on the same issue. A roll of the dice determines what happens: 1 means that there is a drought, 6 means that there is a flooding and 2, 3, 4 and 5 mean that economic investments will work out fine. With every drought or flooding 1 protection measure (bean) is lost, as soon as there is no defence left the governor loses all his economic investments.</p> <p>But the rules change during the game. The introduction of a new dice means that the odds change. Investments based on the earlier odds won't work out as expected. The 'robust option' is introduced: an investment with a relatively low pay-out, but this investment won't be harmed by droughts or floods. This option becomes more popular, as the chances for a drought or flood increase. The game ends with the introduction of a cone as method to decide whether there will be a flood, drought or economic prosperity. After participants discuss the odds, Maarten van Aalst concludes that we cannot predict on which side this cone will fall similar to the fact that we don't know how climate change will impact investments.</p>	
Main conclusions of the discussion	
<p>The discussion after the game showed that many people got aware of the role of uncertainties in the decisions they make. When Stéphane Hallegatte asked 'what did you base your choice on?', one participant admits that she used the outcome of the first round to determine the investments in the second round. Stéphane explained that he sees this more often, and it means that you look back in time to determine your investments. Another participant tells that she evened out the beans, because she figured that all outcomes were equally unsure. Stéphane tells that he noticed that employees of the World bank were constantly calculating the odds to determine their investments, but this became more difficult once the uncertainty increased. People use different strategies when they must cope with uncertainty.</p> <p>One participant asked what the World bank considers a robust option. Stéphane replies that this game is not about the opinion of the World bank. The game is meant to start a discussion between local stakeholders to decide on the best mix of investments, taking climate change and other uncertainties in consideration. Uncertainties depend on the location, and stakeholders decide how to cope with these uncertainties.</p>	





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### Main result or conclusion of the session

Uncertainties play an important role in decision making. Decision-makers are not always aware of these uncertainties and the different strategies others use to cope with these uncertainties. Serious gaming can start a discussion between stakeholders, which helps to formulate a better decision.

### Most exciting insights or outcomes

- Climate change creates more uncertainty in all decision-making
- Different strategies are used to cope with uncertainty
- We are not always aware of all possible strategies to cope with uncertainty
- Serious gaming helps to show the possible different strategies

