

# T07P02 / Public Policy and Uncertainty

**Topic :** T07 / Policy Design, Policy Analysis, Expertise and Evaluation

**Chair :** Joost Buurman (Institute of Water Policy, Lee Kuan Yew School of Public Policy, NUS)

**Second Chair :** Olivia Jensen (National University of Singapore LKY School of Public Policy)

## GENERAL OBJECTIVES, RESEARCH QUESTIONS AND SCIENTIFIC RELEVANCE

Policies are continually being designed for contexts about which policy-makers often have incomplete or no information at all. For example, in the process of design and formulation of water policy, policy-makers grapple with uncertainties owing to a lack of complete understanding of the complex biophysical, social, economic and political systems affecting and being affected. In addition to addressing current challenges, policy-makers and resource managers need to consider how current and plausible new stressors are likely to change/evolve and impact water resources over longer time horizons in the future, in order to undertake effective anticipatory policy design. In a world that is characterized by increasing uncertainty policy-makers need new approaches and tools for policy design and decision making.

The objective of this panel is to review the state-of-the-art in theoretical and empirical research on policy-making under uncertainty.

Some examples exist of application of tools and methodologies to support policy-makers in dealing with uncertainty. However, application and demonstration of various tools to address uncertainty in a policy context often have a rather technical angle and these have yet to be adopted as mainstream tools for policy formulation under uncertainty. A review of the state-of-the-art in theoretical and empirical research in the public policy community can contribute in crossing the bridge from isolated, technical applications to inclusion of uncertainty tools and approaches in the broader policy-making context and theories.

Organizing a panel on this topic holds high relevance as developing policies under uncertainty is become a matter of considerable urgency in Asian deltaic megacities, which face multiple pressures in areas such as water, energy and human development, and is also relevant for other developed and developing urban and rural areas: in deeply inter-connected systems extreme events can easily cascade.

ICPP 2017 in Singapore provides an excellent opportunity to connect regional research and practice in policy-making under uncertainty with the global research community .

## CALL FOR PAPERS

Policy-makers are faced with an increasingly uncertain future, shaped by rapid and potentially dramatic non-linear changes in climate, demography, economy and security. In addition, research on extreme events such as floods and droughts increasing points towards large underestimations of risk and flawed decision making. In public policy, uncertainty is made more pervasive by politics and the policy process itself. The aim of the panel is to review the state-of-the-art in theoretical and empirical research on policy-making under uncertainty. The panel will focus on water, energy, infrastructure, natural resources and climate change but papers focusing on theory and other policy domains are also welcomed. Papers that are comparative in nature, either across sectors or jurisdictions, are of particular interest, as well as papers on urban and Asian contexts.

Some of the important questions that papers might examine include:

- How does uncertainty affect the policy-making process?
- What effect does the political cycle have on policy-makers' ability to address uncertainty effectively?
- What methods are available to policy-makers to choose optimal policies under uncertainty? Are existing methods adequate?
- Are different modes of governance or new evaluation approaches needed for policies in domains characterized by pervasive uncertainty?
- To what extent is knowledge on the nature of policy-making under uncertainty generally applicable across policy domains, countries and governance levels?
- Which groups face the greatest potential costs from uncertainty and how does this influence policy choice?

The Institute of Water Policy hosted a panel at the International Political Science Association 2016 conference in Poznan, Poland, to explore different dimensions of policy-making under uncertainty. The panel was part of IWP's ongoing research on dealing with uncertainty in water policy-making. This panels continues the discussion.



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## Session 1

Thursday, June 29th 10:30 to 12:30 (Block B 2 - 1)

### **The nine lives of uncertainty in decision-making about complex governance issues**

Dewulf Art (Wageningen University)

Robbert Biesbroek (Wageningen University)

In a governance context, decisions are made by both public and private actors, often in interaction with each other. Decision making about complex governance issues are fraught with uncertainties about the current state of affairs, the relevant set of decision alternatives, the reactions of other governance actors, or the future developments likely to affect the issue under consideration. Uncertainty comes in different kinds, however, and its conceptualization has been fragmented across different fields of study. We argue that the nature of uncertainty consists of three types. Policy analysis involving modelling complex systems such as transport or ecological systems have led to distinguishing between epistemic uncertainty (involving lack of knowledge about a particular system) and ontological uncertainty (irreducible unpredictability is due to inherently complex system behaviour). Studies on the interactive and political processes of decision-making have identified ambiguity as an uncertainty of a rather different nature, consisting of conflicts between fundamentally different frames about the issue at hand. Scholars have also argued that there is it important to differentiate between different objects of uncertainty. First, substantive uncertainty, or uncertainty about the content of decisions or policy issues. In addition, network governance scholars have pointed to the importance of strategic uncertainty which refers to the uncertainty about the actions of other actors in the strategic game of decision-making, and institutional uncertainty, which refers to uncertainty about the rules of the game in decision-making. In this paper, we bring together different strands of the uncertainty literatures to present a novel analytical framework that allows to combine the three different natures of uncertainty (epistemic, ontological and ambiguity) and the three objects of uncertainty (substantive, strategic and institutional), providing a comprehensive framework for analysing and addressing the nine lives of uncertainty in decision-making. We exemplify how the nine different types allow for tailored intervention strategies to deal with the different types of uncertainty.

### **A framework to analyze the complex dynamic delta system for adaptive decision making in Bangladesh**

Bhuiya Md Tamim Al Hossain (Utrecht University)

umme Kulsum (Delft University of Technology, The Netherlands and Institute of Water and Flood Management, Bangladesh)

Jos Timmermans (Delft Unniversity of Technology)

Public policy making in many delta system of the world are embarking on adaptive delta management as a promising approach to deal with the intrinsic dynamics and uncertainty that characterizes these systems. Bangladesh is on her way to develop scenario based water-centric adaptive delta plan taking into account future uncertainty in physical and socio-economic developments. Informed decision making on a deeply uncertain future demands for a context specific framework to structure the relevant information of the system and their dynamic relationships. Our objective is to address two key questions: 1) How to analyze the complex dynamic delta system for adaptive decision making under deep uncertainty? and 2) What are the key system components and their dynamic relations for water resource management in the polder systems of southwest coastal Bangladesh? We focused on the polders, which are small embanked but dynamic components of the delta. For this purpose, we adopted the XLRM framework of Lempert et. al. (2003) for scenario development for Bangladesh' polders. The exogenous uncertainties (Xs), Policy Levers (Ls), Relationships (Rs) and Measures (Ms) were identified from extensive literature review on water resource management, community engagement in policy and practice, community adaptation and livelihood. We utilized field data collected by interviewing farmers to establish this framework. This study demonstrates the dynamic interaction of physical and socio-economic processes, policy

response and community response around water resource management in southwest coastal Bangladesh. The major physical system components are climate and hydrologic processes, surface and ground water system, salinity and sediment. These components are influenced by both natural and human actions. The socio-economic activities and policy/ community responses are contributing to socio-economic uncertainty and policy actions resulting for example in specific land use dynamics. The relations reveal that there are certain thresholds which make a specific policy obsolete. Similarly, a gap was identified between the two layers of decision making of public policy and local community, which results in uncertain community responses to public policy actions. Thus, a revision or new strategy is required for both policy regime and community to adapt to the changes in such complex systems. The exploratory approaches that embrace uncertainty are at the heart of adaptive policy making and dynamic adaptive policy pathway. Thus adaptive delta management is well suited to contribute to this revised strategy. We conclude that adaptive decision making can play a key role in facing future uncertainties that unfold in the dynamic interaction of system component. Finally this research work contributes to the scientific knowledge on dynamic interactions of the complex delta system assisting in policy area of water-centric adaptive delta management.

## **Sea-level rise a game changer for public policy?**

Judy Lawrence (NZ Climate Change Research Institute, Victoria University of Wellington, New Zealand )

Sea-level rise challenges public policy-making because existing institutions have been designed to address uncertainty using static and time-bound planning and legal instruments, and community engagement at fixed points. Sea-level rise is a dynamic and partially uncertain process, especially on long timeframes. It thus requires decision-making approaches that can enable policies and implementation choices that can be adjusted ahead of damage occurring, without entrenching current exposure to risk or incurring large adjustment costs in the future. This paper first discusses the nature of the climate change problem, the policy context that creates decision-making challenges and how they have been typically addressed through policy and practice. Second, it shows how an assessment and planning approach, that was designed to address uncertainty and change (the Dynamic Adaptive Policy Pathways (DAPP) planning approach developed in the Netherlands), was integrated into national level guidance in coastal hazard and climate change decision-making in New Zealand. The framework is presented that has enabled DAPP to be integrated into real-life decision processes. The enabling provisions that are required to support such integration are discussed, such as those that enable the community values at stake to be acknowledged through

engagement processes and their monitoring over time and policy institutions that deal with long-term political commitment and its funding. Initial results are also presented from a case study application of the principles of the Guidance approach. The approach enables dynamic and uncertain future conditions to be managed in an adaptive manner. This gives decision makers the confidence and community support to take initial actions on adaptation to climate change, in the knowledge that there are several pathways that can be chosen in the future with minimum societal disruption. The paper concludes with some suggestions as to the applicability of this approach to other decision domains.

The first author has written this abstract based in part on the work of her co-authors of the New Zealand Ministry for the Environment Guidance on Coastal Hazards and Climate Change. They are Rob Bell [National Institute of Water & Atmosphere (NIWA)], Paula Blackett [National Institute of Water & Atmosphere (NIWA)], Sylvia Allan [Allan Planning & Research Ltd], and Scott Stevens [National Institute of Water and Atmosphere (NIWA)].