

Patterns of transition-oriented governance approaches in the Australian urban water sector.

J.J. (Annette) Bos^{1*} and R. R. Brown²

^{1,2} *Centre for Water Sensitive Cities, School of Geography and Environmental Science, Monash University, Building 11, VIC 3800 Australia*

**Corresponding author, e-mail annette.bos@monash.edu*

ABSTRACT

Achieving sustainable forms of urban water management requires experimentation that enables social learning. When analysing the water sector it becomes clear that modern society is much better at technological experimentation than at governance experimentation that enables wider social learning. The literature falls short in explicitly describing the dynamics by which emergent, innovative governance processes contribute to changes in existing, technocratic governance practices and arrangements. This empirical research paper reports the pattern by which a unique case of governance experimentation, within an urban water catchment in Australia, has created the social-political capital for significant changes in an established water governance framework. The study reveals the dynamics in three distinct phases of how experimentation contributed to transformation within the catchment; namely deepening (learning in local context), broadening (replicating in new contexts) and scaling up (new governance structures emerging). Results provide direction for design of experimental projects which aim to transition the water sector to more sustainable practices.

KEYWORDS

Governance experimentation, urban water planning, transition management, transition experiments, Cooks River catchment

INTRODUCTION

There is widespread recognition concerning the need to transition towards more sustainable forms of urban water management. A role for experimentation which enables social learning in order to support transitions is prominent in the environmental and innovation literature. However, when taking a view of the water sector, it becomes clear that modern society has become much better with experimentation that is geared towards technical innovation than experimentation that enables wider learning (Woodhill 2010). While technological experimentation is critical for sustainable development, the learning from these experiments does not often seem to go beyond developing technical knowledge and expertise. It is highly unlikely that learning derived from these experiment leads to questioning the current problem framing, policy objectives and the way these objectives are being achieved. Neither does it lead to fundamental change of context and factors in which decision-making takes place (Pahl-Wostl 2009). Therefore, dealing with persistent societal problems such as transforming traditional urban water management requires experimentation that explicitly aims for multi-stakeholder collaboration in which actors share and challenge their knowledge and perspectives (Beers et al. 2010) and in which informal societal networks to emerge or be

strengthened. This so-called governance experimentation requires interaction, reflexivity and communication.

While the variety of concepts and theories that explain governance processes are growing, there has been little empirical investigation and/or validation into real-life experimental governance processes. In particular, the literature falls short in explicitly describing the patterns by which emergent, innovative governance processes contribute to changes in existing, technocratic governance practices and arrangements. In addition, emerging scholarship on how experimentation contributes to a transition has not been widely tested and/or validated. Therefore, this empirical research paper reports the pattern by which a unique case of innovative governance experimentation within the urban water sector in Sydney, Australia has created the social and political capital for significant changes in an established governance framework. The paper presents the case of a single, bottom up governance experiment undertaken in one sub-system of the Cooks River Catchment, which has subsequently been replicated to six other sub-systems within the same catchment, and is presently in the process of being institutionalised across the catchment. The governance process described within this paper is a case study of Transition Management.

TRANSITION MANAGEMENT

Transition Management (TM) is a “deliberative process to influence governance activities in such a way that they lead to accelerated change directed towards sustainability ambitions” (Rotmans & Loorbach 2010, p.239). A core notion of transition management is that sustainable development requires searching, (social) learning and experimenting (Loorbach 2007). It highlights the need for multi-level governance to create and coordinate policies in a participative manner (Rotmans 2005). Therefore, transition management attempts to make strategic use of bottom-up initiatives through the collaboration of different levels of state and non-state actors and nurtures self-organisation by innovative interaction and cycles of learning and action.

One of the key instruments of TM is a transition experiment. In contrast with traditional technical innovation, transition experiments are innovation projects with a societal challenge (at the level of a sector or region) as a starting point for learning (Van den Bosch 2010). This learning is aimed at contributing to a socio-technical transition, instead of learning about performance of alternative technologies. Transition experiments ideally facilitate learning that questions existing ways of thinking, doing and organising through multi-actor collaboration. This in turn may alter the relationship between individual and organisational actors involved in a certain social-technical system (Rotmans 2005). Three mechanisms have been identified of how transition experiments can contribute to sustainability transitions as desired in the urban water sector. These mechanisms are cycles of *deepening*, *broadening* and *scaling-up* (Van den Bosch 2010). The mechanism of *deepening* denotes learning as much as possible in a local context how to fulfil a societal need in a complete different manner. *Broadening* refers to replicating experiments and connecting them to other contexts or areas. *Scaling up* is about embedding values and ideas underpinning the experiment in dominant ways of thinking, doing and organising.

In order to contribute to a transition, transition management does not situate experiments as isolated instruments, but as part of a broader governance approach which include strategic, tactical, operational and reflexive activities (Loorbach 2007). These governance activities include: (i) Strategic: processes of vision development, strategic discussion, long term goal

formulation, etc; ii) Tactical: processes of agenda building, negotiating, networking, coalition building, etc; iii) Operational: processes of experimenting, project building, implementation, etc.; and iv) Reflexive: processes of monitoring, evaluation and learning.

METHODS

A single-embedded case study research approach (Yin 2009) entailing qualitative data collection methods was employed for this research. To gain in-depth insight into the emergence of a bottom-up governance approach, the first governance experiment of such nature at local level in the urban water sector in Australia has been selected. The industrialised Cooks River Catchment in Sydney is comparable and, therefore, representative to urban water management issues faced by numerous modern cities around the world, especially in places with separate stormwater and wastewater drainage infrastructure (Brown 2005). The examination of the pattern by which governance transformation in the catchment has occurred, involved capturing the views of key actors (scientific and municipal practitioners) who initiated the process and the main council actors who became involved in the process during the expansion of the project. An extensive data collection plan has been carried out involving oral histories, interviews, focus group discussions, and validation workshops with a wide range of stakeholders totalling over 100 participants.

CASE-STUDY BACKGROUND

The Cooks River is a 27 kilometre long river, which flows from south-western Sydney into Botany Bay through some of the most heavily urbanised and industrialised areas in Australia. Its catchment covers approximately 100 square kilometres and is densely populated by around 500,000 residents. Over the past 200 years the Cooks River has been “dammed, diverted, dredged, dumped and thoroughly degraded” (Renwick et al. 2008, p.1). It has a reputation as one of the most polluted rivers in Australia. The institutional framework governing urban water management within the Cooks river catchment is highly fragmented. A large number of organisations, including 13 local municipalities, administer the development and management of water resources management, the provision of water services and related infrastructure, the care of public land and the natural environment. A state government owned corporation is primarily responsible for water supply, wastewater services and trunk drainage, while the Catchment Authority is responsible for catchment management and bulk water supply. Local municipalities are responsible for the stormwater drainage network.

In 1997, the New South Wales Government committed Aus\$60 million to a three year program (the Stormwater Trust) to encourage and support improved urban stormwater quality management practices to improve the condition of the state's urban waterways. As part of this Stormwater Trust, local municipalities were legally required to collaboratively develop stormwater management plans to improve on-ground stormwater management action. While municipalities complied and produced plans which fulfilled the regulatory criteria, for the vast majority of organisations it did not result in on-ground action or other change in regard to sustainable urban stormwater practice (Brown 2003). Analysis of the plans revealed that most plans proposed large and expensive end-of pipe technical solutions, often totaling well beyond the annual budget of the majority of municipalities. The plans showed very limited consideration of social, planning or policy measures aimed at preventative and protective source actions. Similarly, research identified minimum organisation commitment to actual implementation of the plans (Brown 2003). The project planning processes were generally led by engineering consultants. Although the plans were to be prepared jointly across

catchments, with neighbouring local municipalities, state government and other stakeholders such as the community, process facilitators did not exhibit expertise to engage the non-technical community. In addition, the opinion of the residential community was not valued and, therefore, largely excluded.

KEY EXPERIMENTAL PHASES: DEEPENING, BROADENING AND SCALING UP

Upon completion of the research it has been possible to define three distinct experimental phases in the development of governance experimentation leading to transformation in the Cook River catchment. As shown in Figure 1 and in line with van den Bosch (2010), the governance experiment reflects the mechanisms of deepening (learning in local context), broadening (replicating new contexts) and scaling up (new governance structures emerging). Through a cyclic process in which the same governance activity clusters feature, a shadow network (see Olsson et al. 2006) emerged and developed sufficient social-political capital to create change. Each phase within the cyclic process is nested, so the activities, results and learning from the previous phases influence and shape the activities in the subsequent phase. The three phases manifested in three substantial different governance initiatives, the Urban Storm Water - Integrated Management Initiative (2002-2006), the Cooks River Sustainability Initiative (2007-2011) and the Cooks River Alliance (2010-ongoing). The three phases are characterised in detail below.

Deepening Phase:

At the end of 2002, the Urban Storm Water - Integrated Management (USWIM) initiative set out to develop planning guidelines for enabling local collaborative processes for identifying and defining stormwater management priorities and adoptable solutions at the sub-catchment level within a single municipality. The ultimate outcome sought to broaden understanding of and build organisation commitment to healthy waterways through improved management of local urban catchment dynamics. USWIM was developed through a process of searching and learning in a science-practice partnership. The experimental governance process developed entire new ways of thinking and doing within local municipalities as it focused on sub-catchments as the appropriate planning level for water management. It undertook detailed social, physical and organisational profiling to ensure a detailed understanding of the sub-catchment characteristics and the planning context. The initiative involved people from a range of disciplines in identifying problems and solutions – engineers, social planners, environmental scientists, educators, parks and recreation managers. Additionally, it also involved a wide spectrum of stakeholders such as residents, businesses and other government agencies. The initiative resulted in a collaborative urban water planning approach (and its guidelines) developed and applied. Among other outcomes, this led at the catchment level to a community water vision for 2050, management plans which contain site specific solutions and the implementation of various water sensitive urban design (WSUD) technologies. At a municipal level this led to the establishment of an interdepartmental Integrated Urban Water Management group, a full time environmental engineer and commitment to develop sub-catchment plans for all sub-catchments. About 12 municipal staff collaborated within the USWIM process and approximately 60 community members actively engaged.

The USWIM initiative was preceded by the emergence of a small transition arena led by two key-individuals (frontrunners). Through a lengthy self-organised process during 2001-2002 a

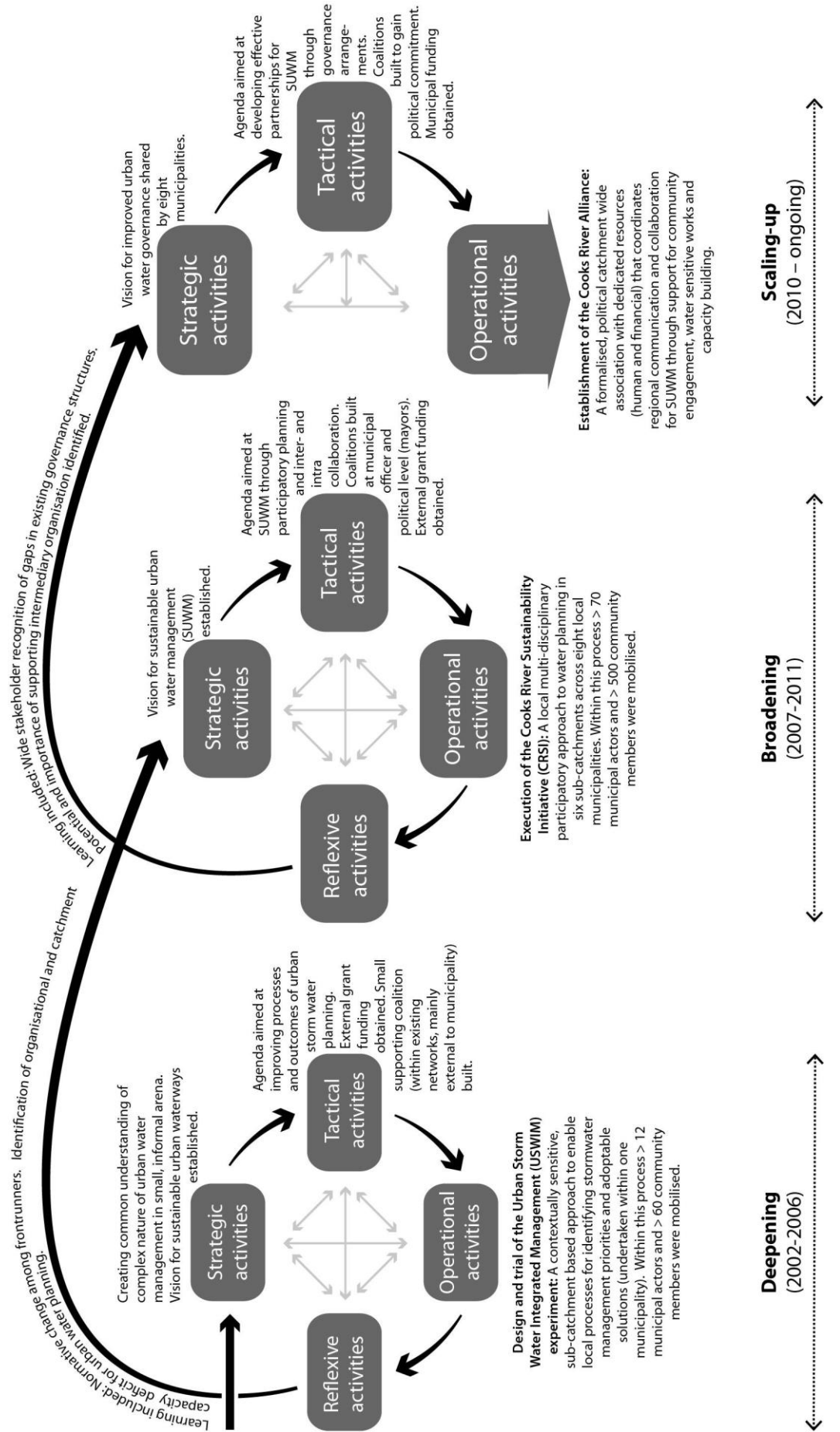


Figure 1. Phases of governance experimentation leading to adaptation in water governance structures in the Cooks River Catchment, Sydney, Australia

common understanding of the complex nature of the urban stormwater management problem was created and a vision for healthy, sustainable urban water ways developed. Based on this vision an agenda to address the strategic need for improved processes and outcomes of urban stormwater planning within a sustainability framework was outlined. This agenda was translated into broad ideas for the USWIM initiative which on one hand aspired to identify a satisfactory solution to urban stormwater planning in the form of developing guidelines for such a planning process. On the other hand, it aspired through its process to grow realisation that stormwater in urban catchment are characterised by uncertainty, complexity, interdependency and multiple stakeholders. By doing so the initiative implicitly aimed for social learning. Frontrunners used existing niche networks to build a coalition in support of the USWIM initiative and to provide expertise during the development of the alternative planning approach. The project was funded through several successful external grant applications.

Broadening Phase:

During the deepening phase, frontrunners recognised that improved urban water planning processes in one municipality would have minimal positive impact on river health and sustainable use of water resources within the Cooks River catchment as a whole. This fuelled frontrunner's desire to replicate the newly developed planning approach within municipalities across the catchment. It also highlighted the need for enhanced collaboration between different municipalities and other stakeholders. Frontrunners built a coalition among an existing municipal officer catchment network to develop a proposal for replicating the project. The project was also funded through a successful external grant application.

Commencing late 2007, the Cooks River Sustainability Initiative (CRSI) aimed to demonstrate how municipalities and communities, working together in highly urbanised contexts, could improve their social and water environments and achieve long-term sustainable water management by developing sustainable water sources, reducing pollution and creating water wise communities. In concrete terms, the initiative strived to improve Cooks River health, conserve water resources, increase the capacity of eight municipalities and its communities, and improve collaboration within and between these municipalities. This was primarily addressed through the application and adaptation of a research driven, locally based, multi-disciplinary, participatory approach to develop locally adoptable sub-catchment management plans for six diverse areas across the Cooks River Catchment. The CRSI repeated and refined the earlier developed USWIM approach. Various thematic cross municipal reference groups were formed to facilitate learning and interaction between the municipalities. Numerous formal and informal training and learning opportunities have been provided for both municipal staff and community members. For example, over the past three years, approximately 850 residents, Councillors, community groups, local and state government officers and technical experts participated in the collaborative processes which included visioning sessions, planning forums and implementation sessions. In addition, over 1100 staff across hierarchical municipal levels and disciplines participated in workshops, interviews and surveys to reflect on the capacity of each municipality to implement sustainable urban water management.

Results of the initiative include: elements of the collaborative planning process adopted within several municipalities; the NSW State Government using CRSI as a prime example of community engagement through their Water for Life Education Hub; site-specific WSUD technologies constructed of which some are designed and constructed by municipalities in-house, rather than the typical consultant approach; community commitment to alternative

technologies proven through high attendance of rain garden planting days; and social capital for change in water governance structure generated. CRSI was set up as a practice/science partnership between the Cooks River Foreshore Working Group, eight municipalities and a university.

Scaling-up Phase:

Developing effective partnerships for embedding SUWM practices within the catchment through improved governance arrangements had been prominent on the frontrunners agenda since the USWIM initiative. An aspiration of developing new Cooks River catchment arrangements within the CRSI proposal was expressed during the broadening initiative. Although this ambition had a stated direction, there were no defined expectations on the outcome of this process. No dedicated activities in relation to addressing this ambition took place for over two years. Through interactive, reiterative processes between municipal officer, executives and political representatives a formal structure supporting sustainable practices in the Cooks River catchment has been developed.

The Cooks River Alliance is politically endorsed as an association of Councillors that will implement a strategic plan for the Cooks River catchment. This plan, approved by all voting members addresses ways to conserve natural resources, improve waterway health, address climate change catchment relevant impacts, engage the municipal community and increase municipal efficiency and capacity. Core business areas of the Alliance include: coordinating regional information, communication and collaboration, building community and municipal capacity, and actively seeking funding for catchment projects. It intends to enhance sustainable water and catchment management practices through support for water sensitive on-ground works, active community engagement, biodiversity conservation and riverbank restoration. At present, eight municipalities have endorsed and committed funding to the Cooks River Alliance; six have done so for three years. Currently, two more municipalities are considering signing up to the Alliance. The Alliance is set to become operational from July 2011 onwards.

REFLECTION

The case study demonstrates that the phases of experimentation have been highly effective as transformation has been achieved with some urban water sector professionals describing this as ‘miraculous’, given the Australian urban water context. On-ground implementation of technical alternatives has certainly supported legitimacy of the governance process. It has, however been the process of engaging a wide range of stakeholders and variety of disciplines that has build the impetus for change within the catchment. Therefore, the research has revealed that local governance experiments have the ability to influence the conventional technocratic socio-technical regime. The change observed in the Cooks River Catchment signifies what De Haan and Rotmans (2011) term an ‘adaptation’ in which the existing socio-technical regime incorporates new functioning. Farrelly and Brown (2011) stress the need for investment in local-scale experiments as social learning mechanisms and for coordination among experimentation to create these shifts in conventional regimes. This study shows that experimentation can be designed to create and grow open learning networks that lead to social learning. In addition, it shows that instruments to actively do so can be employed in practice. Therefore, this research confirms that current schematic thinking in transition management¹

¹ The application of transition management has not been a deliberate process in this case-study. The scope of this paper does not allow elaboration on this matter.

provides a plausible framework for describing transition dynamics as it offers valuable insights into how social learning can be achieved and how cumulative experience can be captured and utilised. Moreover, it shows that the mechanisms of deepening, broadening and scaling-up can be applied in practice to steer and direct processes into a sustainable direction. This study contributes to the field of transition management by providing depth on dynamics of actors and networks in the emergence of each of these phases.

CONCLUSIONS

This paper has revealed the need for experimental processes to address innovation from the perspective of a societal challenge as this guides broader learning and searching processes needed for transformation of the water sector. The research on the dynamics of governance experimentation has shown that the mechanisms of deepening (learning in local context), broadening (replicating in new contexts) and scaling up (new governance structures emerging) when applied systematically can contribute to a transition to more sustainable practice. Insights from this case-study not only provide direction for design of experimentation, but also how frontrunners and their shadow networks can be mobilised and sustained over time to create a breakthrough in traditional governance regimes.

ACKNOWLEDGEMENTS

We gratefully acknowledge the OurRiver-Cooks River Sustainability Initiative for financial support of this research project.

REFERENCES

- Beers, P., Sol, J. & Wals, S., 2010. Social learning in a multi- actor innovation context. In 9th European IFSA Symposium, 4- 7 July 2010, Vienna, Austria.
- Brown, R.R., 2005. Impediments to integrated urban stormwater management: the need for institutional reform. *Environmental Management*, 36(3), 455-468.
- Brown, R.R., 2003. *Institutionalisation of Integrated Urban Water Management: Multiple-case analysis of local management reform across Metropolitan Sydney*. PhD thesis. Sydney: University of New South Wales.
- De Haan, J.H. & Rotmans, J., 2011. Patterns in transitions: Understanding complex chains of change. *Technological Forecasting and Social Change*, 78, 90-102.
- Farrelly, M. & Brown, R., 2011. Rethinking urban water management: Experimentation as a way forward? *Global Environmental Change*, In press.
- Loorbach, D., 2007. *Transition Management: New Mode of Governance for Sustainable Development*, Utrecht: International Book, the Netherlands.
- Olsson, P. et al., 2006. Shooting the rapids: navigating transitions to adaptive governance of social-ecological systems. *Ecology and Society*, 11(1), 18.
- Pahl-Wostl, C., 2009. A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change*, 19(3), 354-365.
- Renwick, C. et al., 2008. *Cooks River Integrated Interpretation Strategy*, Sydney, Australia: The Cooks River Foreshores Working Group.
- Rotmans, J., 2005. *Societal innovation between dream and reality lies complexity*, Rotterdam: ERIM, Erasmus University Rotterdam.
- Rotmans, J. & Loorbach, D., 2010. Towards a better understanding of transitions and their governance: a systemic and reflexive approach. In J. Grin & J. Schot, eds. *Transitions to sustainable development: new directions in the study of long term transformative change*.
- Van den Bosch, S., 2010. *Transition experiments: exploring societal changes towards sustainability*. PhD thesis. Rotterdam: Erasmus University.
- Woodhill, J., 2010. Capacities for Institutional Innovation: A Complexity Perspective. *IDS Bulletin*, 41(3), 47–59.
- Yin, R.K., 2009. *Case Study Research: Design and Methods* Fourth Edition., Sage Publications Inc.