

Bonno Pel¹, Jurian Edelenbos & Arwin van Buuren (Erasmus University of Rotterdam (NL), Governance of Complex Systems Research Group, Department of Public Administration)

The design of design:

A systems approach to Integral Planning and spatial Design in the Dutch Southwest Delta

Abstract submitted for the 2nd European Forum for Studies of Policies for Research and Innovation conference, Karlsruhe, June 12th -13th 2012, (sub-theme Governance of transformative change)

[Key words: Transitions, Delta area management, Systems Thinking, Spatial design, Governance]

The mission-oriented turn as proposed in the 2009 Lund declaration advocates ‘research addressing the Grand Challenges of our time, moving beyond the current rigid thematic approaches’. This contribution exposes how such research is taken up in the Dutch ‘Integral Planning and Design in the southwest Delta’ (IPDD) project², specifying the challenges of spatial design in the context of societal complexity and sustainability transitions. To redefine societies’ challenges is to redefine the task of spatial design, as well as its relations with governance and data management. One of the key questions raised in the project is therefore the following: *In what way do the composed nature and complex dynamics of the delta areas on the one hand and the anticipation to future transformations and transitions on the other hand put new demands on the form, function and role of spatial design in reaching synchronized/integrated/interconnected delta area development?*

The Dutch Southwest Delta is a densely populated delta area, roughly bounded by the North Sea, the ports of Rotterdam and Antwerp and the Brabant province. The area is widely considered to be a hallmark of the Dutch tradition in spatial planning and water management, and especially of its longstanding struggle to cope with and transcend its natural conditions. Yet however ingenious and successful in terms of flood protection, it is increasingly acknowledged that in the longer run, business-as-usual policies will fall short: Rising sea levels and increasing river discharges pose mounting pressure on the system, and the Delta works’ ecological shadow sides have only become more prominent - revealing the unintended consequences of earlier engineered spatial solutions (IPDD, 2011). The distant but real possibility of future transitions and catastrophes has thus prompted a national Delta Program to meet future water challenges. Parallel to but independent from this policy initiative, the interdisciplinary IPDD project serves to inform current and future decision-making. The project especially seeks to sensitize stakeholders to the broader system dynamics these water challenges form part of: The delta’s complex spatial system and equally layered and diverse societal system yield a variety of intertwined challenges, also involving issues of agriculture, industrial development, preservation of natural areas and restructuring of the energy sector (Meyer, 2005). This broad and long-term oriented view responds to the largely sector-based designs and strategies developed thus far (IPDD, 2011). The aim is to develop a methodic for design and planning in the Southwest delta and other densely populated delta areas, taking into account both the complexity of the challenges and the changing conditions under which solutions are to be devised. Considering the changing task and circumstances of spatial planning and design, IPDD’s mission can therefore be characterized as the ‘design of design’.

Deliberately intended to develop a complexity-sensitive form of spatial design and planning, IPDD has taken a systemic approach: Following recent theoretical advances in transition management (Rotmans, 2003, 2006, Loorbach, 2007, Grin et al., 2010) and social-ecological resilience (Folke, 2006, Scheffer, 2009), the delta area is conceptualized as a complex adaptive system of co-evolving subsystems, with constant interplay between the spatial layers of substrate, networks and occupation patterns (Sijmons, 1991). This conceptualization helps to break loose from reductionist and sector-based approaches that have marked earlier spatial design and water management in the Netherlands; non-linear system

¹ Corresponding author: drs. Bonno Pel, Erasmus Universiteit Rotterdam, Dep. of Public Administration, room M8-35, Burg. Oudlaan 50, 3000DR Rotterdam (NL), pel@fsw.eur.nl

² <http://ipod.verdus.nl>

developments are taken into account. Moreover, this acknowledgement of complexity not only pertains to the physical-ecological properties of the area, but to its societal dimension as well: The delta is understood to involve a multitude of societal actors, dispersed over various sectors and scales. Under these conditions of dispersed control nobody is in charge, actors are frequently confronted by the unanticipated consequences of others' actions (Teisman et al., 2009), and the mismatch between 'governing system' and 'system to be governed' can be considered pervasive (Folke et al., 2005, Termeer et al., 2010). In line with Luhmann (1995), Nowotny (2005) and Ulrich (1983), an essential source of complexity is that actors diverge in their system understandings, and that systemic problems and solutions cannot be assumed obvious. This implies a radical break with social engineering and other approaches in which this complexity of meaning is bypassed: A crucial governance challenge is not so much the integration of interests and the forging of consensus, but rather the continuous task of attunement and 'synchronization' (Teisman & Edelenbos, 2011, Pel, 2012) between system understandings. Advances in geographical information systems and decision-support are promising precisely for the added capacity to articulate and inform these system understandings, and to facilitate *dynamic* system representations (Kooistra et al., 2009, Vervoor et al., 2010). Based on these considerations, the practice and content of spatial design is reconsidered. Beyond traditionally sequential order of survey-plan-governance, IPDD develops an interdisciplinary approach commensurate to the dynamic and multifaceted task: Understanding that survey-before-plan and command-and-control approaches no longer suffice, expertise on spatial design, governance, and data management is brought in constant interaction. The methodic-in-development crucially hinges on integration within the design-governance-GI(D)S triangle, taking shape through interrelated activities in 1. Historical transitions analysis, 2. Scenario development, 3. Participative design of regional spatial concepts, 4. Urban design in focal areas, and 5. International comparison of delta areas. Through a cyclical build-up of the project, IPDD seeks to secure gradual refinement of its design-of-design.

As the 2-year project started in the fall of 2011, only early insights can be reported. On the basis of conceptual developments, results can be expected to be achieved in the following three respects. First of all, the project promises to generate insights into the governance of system innovations and transitions: However great the conceptual advances in this area, questions remain on the practical and political aspects of avoiding, stimulating and coping with future transitions (Smith & Stirling, 2010). A specific issue is how to build and maintain the requisite synchronization (Teisman & Edelenbos, 2011, Pel, 2012) between the diversity of actors involved with this transformation processes. Second, IPDD promises to further develop the possible role of spatial design in these processes: As yet, transitions research has been found to be lacking in geographical concreteness (Coenen et al., 2011), and IPDD's cross-pollination between the spatial layers approach and transitions research is one step in this direction. Third, the systems-theoretically informed interplay between governance, spatial design geographical information systems experts promises to reinvent spatial design. The challenge is to move beyond technocratic visioning, imaginatively empty compromises or merely instrumental spatial design (Zonneveld & Verwest, 2005). The methodic is to shape design practices that are particularly sensitive to the complexities of long-term-oriented governance, while fully capitalizing on the rapidly augmenting possibilities to gather, process and present spatial information to decision-makers, experts and stakeholders.

As mentioned, the IPDD methodic should inform decision-making and spatial design in delta areas, with the Dutch Southwest Delta as its 'laboratory'. While elaborating a methodic sufficiently generic to be applicable in other areas, the project team has also committed itself to regularly reflect on ongoing decision-making and visioning in the Delta Program. Focusing on complex dynamics and possible transitions, implications for policy will not be of an instrumental kind. IPDD aims to sensitize stakeholders to the complexity at hand, and to help them anticipate on future transitions. This also implies that the allure of the singular 'system leaps' will be counteracted, highlighting instead the manifold of smaller and greater systemic changes that manifest across sectors and scales.

Literature

Coenen, C., Benneworth, P. & Truffer, B. (2011), Towards a spatial perspective on sustainability transitions, DIME Final Conference, 6-8 April 2011, Maastricht

- Folke, C. (2006), Resilience: the emergence of a perspective for social–ecological systems analyses, *Global Environmental Change*, 253–267
- Folke, C. et al. (2007), The problem of Fit between Ecosystems and Institutions: Ten Years Later, *Ecology and Society* 12 (1), 30, <http://www.ecologyandsociety.org/vol12/iss1/art30/>
- Grin, J., Rotmans, J. & Schot, J. (2010), *Transitions to sustainable development*. New York, Routledge.
- IPDD (2011), *Urban Regions in the Delta; Integrale Planvorming en Ontwerp in de Delta*, project description
- Kooistra, L., Bergsma, A., Chuma, B., de Bruin, S. (2009), Development of a dynamic web mapping service for vegetation productivity using remote sensing and in situ sensors in a sensorweb based approach. *Sensors* 9: 2371-2388 (doi:10.3390/s90402371).
- Loorbach, D. (2007), *Transition management*, Utrecht, International Books
- Luhmann, N. (1995), *Social Systems*, Stanford University Press, Stanford:CA
- Meyer, H. (2005), Reinventing the Dutch Delta: Complexity and Conflicts, *Built Environment*, 35(4), 432-451
- Nowotny, H. (2005), The Increase of Complexity and its Reduction; Emergent Interfaces between the Natural Sciences, Humanities and Social Sciences, *Theory, Culture & Society*, Vol. 22(5), 15–31
- Pel, B. (in press), *System Innovation as Synchronization; Innovation attempts in the Dutch traffic management field*, Ph.D. thesis, Erasmus Universiteit Rotterdam
- Rotmans, J. (2003), *Transitiemanagement*, Assen, Van Gorcum.
- Rotmans, J. (2006), *Societal Innovation*. Rotterdam, Erasmus University Rotterdam.
- Scheffer, M. (2009), *Critical transitions in nature and society*, Princeton, Princeton University Press.
- Sijmons, D. (1991), *Het casco-concept. Een benaderingswijze voor de landschapsplanning*, Ministerie LNV, Utrecht
- Smith, A. & A. Stirling (2010), The politics of social-ecological resilience and sustainable socio-technical transitions, *Ecology and Society*, nr. 1, article 11.
- Teisman, G.R., Van Buuren, M.W. and Gerrits, L.M. (eds.) (2009), *Managing Complex Governance Systems: Dynamics, Self-Organization and Co-evolution in Public Investments*. New York: Routledge.
- Teisman, G.R. & Edelenbos, J. (2011), Towards a perspective of system synchronization in water governance, *International Review of Administrative Sciences*, nr. 1, 101-118.
- Termeer, C, Dewulf, A. & van Lieshout (2010), Disentangling Scale Approaches in Governance Research: Comparing Monocentric, Multilevel and Adaptive Governance, *Ecology and Society* 15 (4): 29, <http://ecologyandsociety.org/vol15/iss4/art29/>
- Ulrich, W. (1983), *Critical Heuristics of Social Planning, A new approach to Practical Philosophy*, Haupt, Bern
- Vervoor, J.M., Kok, K., van Lammeren, R., Veldkamp, T., 2010. Stepping into futures: Exploring the potential of interactive media for participatory scenarios on social-ecological systems. *Futures* 42, 604-616.
- Zonneveld, W. & Verwest, F. (2005), *Tussen droom en retoriek*, Den Haag / Rotterdam, Ruimtelijk Planbureau / NAI Uitgevers.