Chapter 23

Commentary: Voluntary Agreement in Multi-use Climate Adaptation in the *Oekense Beek* from a Politic-Economic Perspective

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Introduction

Recent high impact floods and droughts were experienced across the EU, where the economic and social impact was significant (Guha-Sapir et al. 2016): more than five times the losses incurred between 2000–2012. Driven by climate change, extreme flooding events, such as those experienced across the EU, are expected to increase in frequency with models suggesting that average annual economic losses predicted to exceed EUR 23 billion over the same period (Jongman et al. 2014). Preparing for and building resilience against future natural hazards events is challenging and resource-intensive (e.g., time, financial, etc.) with key difficulties for practical application. This era of climate change calls for new robust (i.e., inclusive of known or probable risks) and flexible (i.e., incorporating uncertain or possible risks) risk management approaches. The desire to manage land and water sustainably, introduce resilience to climate change, assess risk and implement sustainable environmental management strategies has broad support, but defining “sustainable” management has proven difficult for policymakers. One adaptation strategy might be Nature-based Solutions (NBS). NBS aim to harness ecosystems through both their resilient adaptive eco-services and sustainable integrity that will provide short-, medium- and longer-term solutions to managing the risks associated with climate-driven extreme hydrometeorological events being experienced across Europe and globally. Nature-based solutions for hydrometeorological risk mitigation and adaptation in river catchments involve, for example, Natural Water Retention Measures (NWRM), space for the rivers, or measures for resilient cities (i.e., green infrastructure in cities, green roofs, decentralized rainwater management). These solutions are also referred to as “green and blue infrastructure”. Nature-based solutions to water-related risks cannot entirely

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substitute for traditional measures such as flood pathway and receptor approaches both structural and behavioral (e.g., flood walls, channels, flood warnings), but their potential value for mitigation and adaptation has been recognized (Lafortezza et al. 2018). As such, NBS can often be easily designed in engineering terms and provide a good complement to local climate adaptation strategy, but a limiting factor is the area of land required to provide sufficient storage in the appropriate place to be useful. Nevertheless, implementing and paying for NBS and for grey or mixed (grey and green) infrastructure, requires not only appropriate technical data, risk analysis, functional testing but requires funding for building and maintaining the various targeted options over variable time-space continuums. There are significant differences between countries worldwide on how NBS must be implemented; but generally at least three main barriers can be summarized:

- Cultural and social barriers: for example, in England and Wales FRM policy, the political definition has not so far been publically acceptable to use private land (upstream) to sacrifice it for the downstream communities as a mainstream strategy (Thaler 2015).
- Uncertainties in frequency and magnitude: using flood storages as key FRM scheme also causes significant uncertainties about the next event, which cause large concerns by private landowners about how to use the land.
- Mechanisms of compensation: flood storage includes the challenge of transferring a risk and benefit to others. This causes complicated discourse about the preferred form and institutional set up of compensation. For example, Ungvari and Kis (2013) showed that the implementation of flood storages on the Tisze river basin is that farmers and government have different views on how to organise the payment scheme (small fixed annual amounts or large amount based on the event).

Use of Economic-Policy Instruments in Flood Risk Management

As a result, the change in ownership such as land buying or taking by land expropriation might be approached to implement NBS. One solution might be to use/implement Economic Policy Instruments (EPIs) to manage easier water-related risks. EPIs have become more popular in the past decade, in particular, with the implementation of various EU regulations and directives. The range of EPIs can be as follows: (1) innovative payments schemes (i.e., compensation by public administration or insurance); (2) financial incentives for land-use changes (e.g., agro-environmental schemes); (3) flood risk pooling schemes; (4) financing schemes for urban development for stormwater management; (5) voluntary agreements, for example, between urban and rural areas; and (6) cap and trade schemes, like the insurance bonus malus system (Thaler 2015). In the Oekense Beek study area, the aim was to use the EPI voluntary agreement between private landowners (i.e., farmers) and users, such as regional water authority, the province, municipality Brummen as well as the

Table 23.1 Framework of analysis: revealing opportunities in multi-use climate adaptation

	Focus of research questions	Short description	Revealing opportunities
Natural capital	Focus on flood event (hydrology science)	<ul style="list-style-type: none"> • Catchment characteristics • Flood characteristics • Retention volume capacity 	Landform engineering
Social capital	Focus on stakeholders (sociology science)	<ul style="list-style-type: none"> • Flood risk perception • Solidarity and trust • Social network 	Participation process
Institutional framework	Focus on power (political science)	<ul style="list-style-type: none"> • Formal/informal rules • Administrative boundaries 	Pilot removes such barriers
Socio-economic activities	Focus on funding (economic science)	<ul style="list-style-type: none"> • Socio-economic losses 	Compensation schemes

natuurmonumenten. First of all, the definition of a voluntary agreement is open to argument (OECD 2003) and is often simply defined as any approach that does not involve a legally enforceable requirement that is imposed on one party to take action in the interests of another. Nevertheless, capturing, analyzing and understanding differences of success and failure in the adoption of voluntary agreement is challenging (Thaler 2015) yet necessary to encourage and support stakeholders' engagement in this direction and to understand limits in the transferability of success from one case to another. The successful implementation of voluntary agreements is clearly influenced (positively or negatively) by a number of factors. These factors may constrain the feasibility and acceptability of a project but also determine its efficiency. Providing and pre-empting an exhaustive list of factors would be misleading. However, these factors can be grouped into four categories: (a) natural capital, (b) social capital, (c) institutional framework and (d) socio-economic activities (see Table 23.1).

Natural capital refers to the stock of resources that provides environmental services. The catchment characteristics play a central role to implement flood storage areas. The retention volume capacity for instance will depend on various natural factors such as the landscape profile, the soils and the geological conditions (EA 2009). The volume capacity also needs to match the hydrological behaviour of the catchment, the considered river and the upstream and downstream tributaries. A central aim of using catchment-wide NBS is to protect high value/vulnerability (usually urban) areas in the lower part of the catchment. Therefore, the central question and conflict arise how to compensate low-intensity agricultural areas and how to motivate farmers to provide the land as in the Oekense Beek example. Behind this simple transfer—interesting from a flood management and an economic perspective—lie potential sources of social tension and resistance to the project as the transfer from

one location to another (e.g., often from one community or administrative boundary to another) means risk. The pre-existence or prior lack of shared knowledge, trust and social connection may influence the acceptability of such transfer. A critical element is the interaction (*social capital*) between farmers and other stakeholders from urban areas. Most of the time, the examples show a lack of social capital of these two groups by a lack of risk culture and/or solidarity. One recurrent conflict is the impact that adopting environmentally friendly measures may have on the *socio-economic activities* for farmers, as it reduces the profitability of a business by internalising externality. There is the question how to organise the compensation, which is often based on a negotiation process. However, such negotiations are regulated by *institutional framework* (Ostrom 1986; Scott 1995), formal and informal, which may affect the implementation of a policy instrument. An understanding of the possibility and limits within the institutional framework is crucial. In the context of implementing flood storage areas, it is essential to investigate the question of property right (e.g., right to flood/right to be protected), to land use planning (e.g., flood-prone areas defined or not) and to existing policy on the funding mechanism (e.g., right to compensate). Voluntary agreements involving a form of compensation are often preferred; yet their implementation differs from one place to another (in particular challenging the upscaling or transfer the lessons learn to other cases).

In seeking to construct a flood storage area, there are alternative forms of power that might be used, with associated advantages and disadvantages. Because flood storage requires space and place, a purely market-based approach cannot always be relied upon to assemble the necessary area required in the appropriate place. In addition, the rules covering action by a particular administrative unit commonly will not allow it to buy land outside of its administrative boundaries. This is usually even more the case when the expropriation of land is concerned; for example, the Netherlands does not have the legal powers to acquire land in Germany through compulsion in order to construct a flood storage area. In strongly federal states, the same is true between federal states. Hence, a voluntary agreement may be the only viable option when action is desired outside of the boundaries of proposing body.

Alternatively, if an attempt to use power is likely to be met by resisting power, there are two reasons why a voluntary approach may be preferable. Firstly, even if the resistance can be overcome, this will involve costs and time delays. Secondly, creating an adversarial context in one case can incur long-term costs by creating the anticipation by one or several parties that the future will also be one of conflict even when the interests of the parties actually coincide. Conversely, establishing cooperation in one instance may create a precedent for future cooperation and a norm of reciprocity (Nowak and Highfield 2011).

Conclusion

In FRM, voluntary agreements are now also receiving a lot of interest as complements to the existing policy instruments in order to achieve the objectives the EU

Water Framework Directive and of the EU Floods Directive, such as the implementation of flood storages and use of natural retention areas. Whilst the issues of scale and fit of administrative units to physical problems have been identified (Underdal and Young 1997), if it is impractical or inappropriate to change the boundaries of the administrative, it is necessary to create bridging mechanisms (Kohn 2008) to enable co-action across the boundaries of the existing administrative units. Thus, the central problems addressed in the Oekense Beek and many other examples are the appropriate use of power and bridging across the boundaries to power created by rules. At the same time, the use of economic instruments has been questioned from the perspective of social equity (Thaler and Hartmann 2016). The importance of equity and distributional issues (be it between water use sectors, social groups or regions) is in fact receiving increasing attention in many policy discussions and research activities in different parts of the world. Not all these objectives are fulfilled to the same extent by the different economic instruments. More often than not, in practical policy implementation more attention is paid to use of EPI as a mean to raise revenues than to efficient allocation of water use/water service delivery.

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