



**Translation Mechanisms in Socio-Technical Niches
A case study of Dutch river management**

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Abstract

This paper makes three contributions to the field of transition research. First, it sheds light on how the concept of translation can contribute to a better understanding of agency in niche development. Second, it articulates how the local-global distinction in the Strategic Niche Management (SNM) approach relates to the levels in the Multi-Level Perspective. Third, the article is empirically novel by presenting a radical sustainable innovation in Dutch water management ('New Rivers').

Keywords

Sustainability transitions, translations, strategic niche management, river management

1. Introduction

Over the last twenty years Innovation Studies and Science and Technology Studies (STS) have evolved to focus on a diversity of topics and research questions. A relatively recently developed line of research combines insights from both evolutionary theory and sociology of technology. The Multi Level Perspective (MLP) (Rip and Kemp, 1998, Geels, 2002, Markard and Truffer, 2008) aims to understand major socio-technical change by conceptualising transformations as the result of processes occurring at and between three inter-related levels: niches, regimes and landscape. *Socio-technical regimes* are the dominant rule-sets supported by incumbent social networks and embedded in dominant artefacts and prevailing infrastructures. The *socio-technical landscape* is considered exogenous and provides the environment in which regimes evolve. Radical innovation originates in *niches*: small protected spaces in which new socio-technical practice can develop, protected from harsh selection criteria and resistance from prevailing regimes. Socio-technical transitions, changes from one stable regime to another, are conceptualised in the model as occurring when landscape pressures destabilise prevailing regimes, providing breakthrough opportunities for promising niches.

The concept of niches has been further elaborated in a number of publications on Strategic Niche Management (Kemp et al, 1998; Schot and Geels, 2008). This literature, however, has been criticised for putting too much emphasis on a planned, well ordered and consensual management approach (Lovell, 2007). While Lovell does not discuss publications that emphasise non-linearity and contestation in niche-based approaches (cf. Geels and Raven, 2006), indeed, a critical reading of SNM literature may give the impression that building niches evolves quite linearly from articulating an attractive vision about some kind of sustainable future, finding partners to form a new social network, implement experiments, and learn from those for further adaptations.

This article aims to contribute to this debate by linking the SNM perspective with the concept of *translations*. Translation is a concept originating from Actor Network Theory (Callon, 1986a), denoting the transfer of objectives from one actor to other actors, thereby recruiting others into the network surrounding the primary actor. The literature on translations, we expect, can help to bring agency, contestation and real-world chaos and complexity of strategic niche management in practice much more to the foreground. The value of focusing on translations in transition studies was previously shown by Smith (2007). He found that regimes and niches interact on a continuous basis, redefining their mutual position, adapting to each other's insights and influence their surroundings through mutual interaction. He concludes that translation mechanisms are promising new ground for research arguing that 'a case has been made that socio-technical translations must become a focus for further analytical and policy attention'.

In this paper, we will examine how actors and networks, operating *within* niches, coordinate their actions and mutually adapt. Our case is a novel sustainable water management innovation ('New Rivers') originating from visionary and networking activities of the Dutch InnovatieNetwerk – an intermediary organisation aimed at developing and implementing radical new concepts in agribusiness and rural areas. We will build upon a recent conceptualisation in SNM that makes a distinction between local experiments and a 'global' niche level (Geels and Raven, 2006; Raven et al., 2008). 'Local' refers to socio-technical experiments taking place in specific geographical contexts. We will elaborate on the SNM perspective and the local-global distinction in the following section.

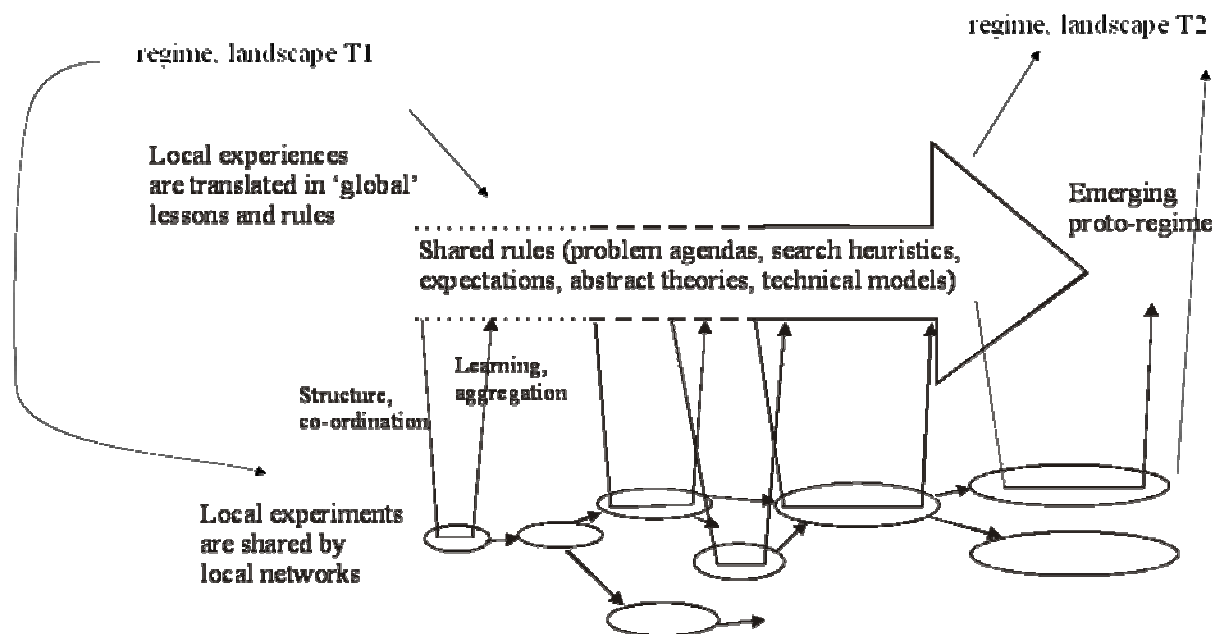
The main research question is: how can the SNM perspective benefit from a focus on translations in terms of an improved understanding of agency in niche development? By addressing this question, this article will make theoretical and empirical contributions. First, we aim to shed light on how the concept of translation can bring agency more to the foreground in the SNM perspective. Second, the paper contributes to the field of SNM by articulating how the local-global distinction can be conceptually related to the levels in the MLP. Third, the article is empirically novel by adding insights

from 12 interviews with stakeholders in 2 undocumented 'New River' locations to the already existing literature on InnovatieNetwerk (Grin and van Staveren, 2007) and the 'New River' niche (Klijn et al, 2008; Van 't Klooster and Hajer, 2009).

2. Strategic Niche Management and translations

Foundations for Strategic Niche management (SNM) were laid in the early 1990s¹. Based on case study research on electric vehicles, SNM scholars found that intentional regime shifts are extremely difficult to accomplish (Kemp et al, 1998). Indeed, prevailing regimes are generally very stable through lock-in effects and resistant to change. Promising sustainable technologies often lack a clear market demand within the context of existing regimes. Hence, intentional construction of partially and temporarily *protected* spaces – technological niches – is considered to be important to prevent too early rejection of potentially sustainable innovations. Experimental projects such as pilots are means to create technological niches. The literature emphasises the role of articulating positive expectations, shaping new social networks and successful learning as constituting processes.

Furthermore, Geels and Raven (2006) conceptualise how local experiments are enabled and constrained by a global niche level (Figure 1). 'Local' is about practices: the experiments with adapting different aspects and variations of the novel technology to local contexts to make 'configurations that work'. These experiments are carried by a variety of local networks, generating knowledge that is location specific. The global niche level refers to an emerging institutional environment of shared rules such as problem agenda's, search heuristics, abstract models and shared expectations and visions, as well as distinct networks that work to coordinate flows of knowledge, codify generic lessons and articulate field-level agendas. Hence, the global niche level is a socio-cognitive structure.



¹ Schot and See Geels (2008) for a more elaborate history of SNM.

Figure 1: Local projects and the global niche level (adapted from Geels and Raven, 2006)

The local-global distinction is very relevant for the ‘New River’ case. InnovatieNetwerk can be positioned as an actor trying to translate ‘global’ visions into local experiments (section 4). However, the distinction also raises new questions. First, it is conceptually unclear how this distinction relates to the levels in the MLP. Does it introduce a fourth level next to niches, regimes and landscapes? If not, how can we understand the local-global distinction in relation to the MLP? To address this issue, it is necessary to elaborate how structure and social practice are related (figure 2). The MLP conceptualises ‘structure’ as a nested hierarchy of three levels with varying ‘stability’ (Geels, 2004). Novel social practices in experiments are both enabled and constrained by an emerging niche level, while this emerging structure can only exist because it is enacted by those practices. Initially structuration is weak and knowledgeable and resourceful actors have considerable freedom, while over time niche structures can stabilise, shifting the balance between agency and structure more towards the latter. Of course social practice is also structured by rules of prevailing regimes and landscapes, which are more stable and provide more coercive structure to social practices. Hence, for radical innovation (partial and temporary) protection against these structures is necessary on the short term, while on the longer term niche actors work towards adapting prevailing regime rules to the benefit of their niche innovation or build a competitive and powerful new proto-regime. This conceptualisation allows for a continuum from radical niche experiments to traditional regime projects depending on the extent to which a social practice in an experimental project is structured by rules pertaining to the niche, regime and landscape levels.

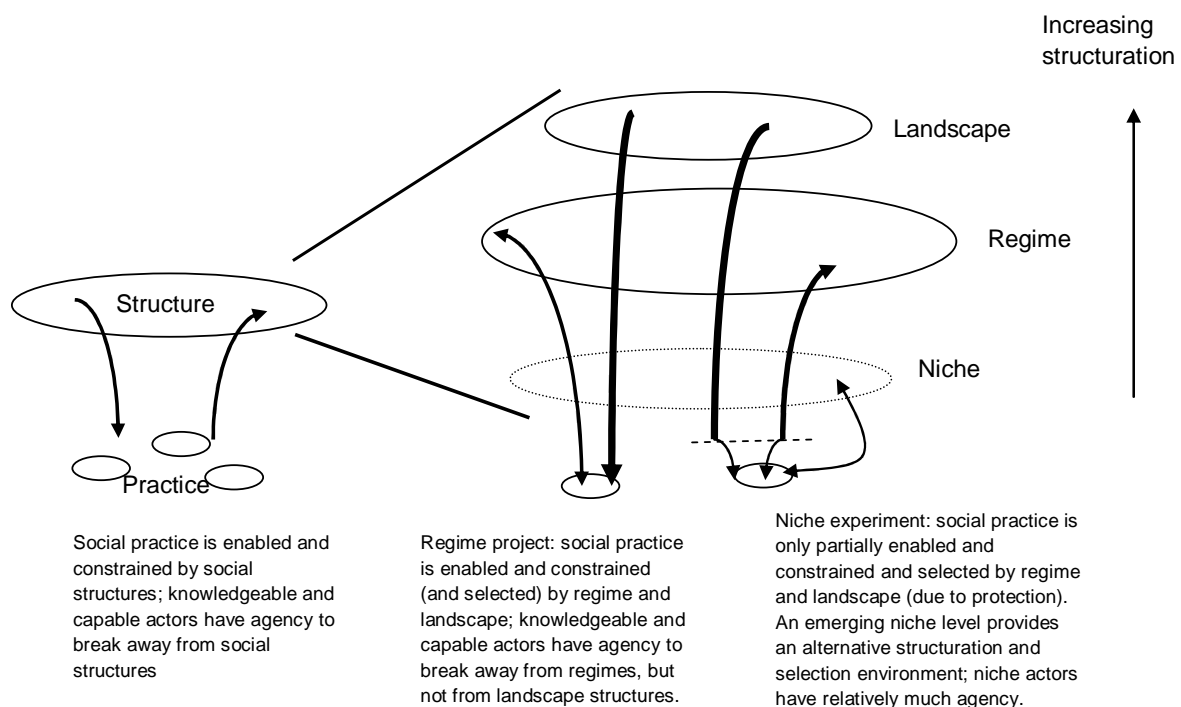


Figure 2. Local practices and socio-cognitive structures in relation to the multi-level perspective.

A second question is how agency can be conceptualised in local-global interactions. As argued above, the SNM perspective has been criticised for a lack of attention for the complexity of strategic niche management in practice (Lovell, 2007). Some insights are provided by Geels and Raven (2006),

who stressed that local-to-global aggregation activities are difficult: ‘the transformation of local outcomes into generic lessons and cognitive rules does not occur automatically, but requires dedicated aggregation activities’. Similarly, Raven et al. (2008) argue that global-to-local structuration should also not be conceptualised as straightforward and linear: ‘both the translation of a generic concept into a local project variation as well as the transfer of local lessons into global rules occur, but are difficult and require dedicated work. [...] Ready-made solutions cannot be dropped into a context without negotiations and struggle.’ However, these accounts lack a detailed discussion of how agency works in the local-global niche perspective.

Translation is a promising concept to bring agency more to the foreground in niche-based approaches (Smith, 2007). Translation is the process through which actors realise their actor-worlds (Callon, 1986a; 1986b). Translation can be seen as constituted by various moments. The first moment is ‘problematization’. It refers to framing of problems by the actor intended to realise its actor-world in such a way that they become ‘indispensable’ or an ‘obligatory passage point’. In the case of the New Rivers concept, InnovatieNetwerk has tried to reframe the problem of water management by turning it up side down: water is not a problem that needs containment, but an opportunity for recreation, sports, nature development and water-side houses. In such an actor-world the vision of New Rivers becomes an attractive way of dealing with rising water levels and, at the same time, InnovatieNetwerk becomes a central actor.

The second moment of translation is ‘interessement’ and refers to the actions that the ‘translator-spokesperson’ undertakes to interest other actors in their actor-world. Interessement is a process of struggle, because actors that are being targeted by the translator-spokesperson not necessarily hold the same views, on the contrary. Acts of interessement can easily be ignored or challenged. As we will show in our case study, InnovatieNetwerk has undertaken much work on interessement. Indeed, we will identify various mechanisms how InnovatieNetwerk tried to interest local actors for their vision on sustainable water management (table 1).

The third moment of translation is ‘enrolment’. Enrolment is the outcome of successful interessement, i.e. when actors accept their new roles and support it with positive actions. Hence, enrolment is also about displacement: actors are being displaced into a new position in the network with different roles. Contrarily, interessement can result in no enrolment or even negative actions to deligitimise the actor world articulated by the translator-spokesperson. In the case of InnovatieNetwerk, we will show that there were several of such actions (table 2).

The fourth and final moment of translation is ‘mobilisation of allies’. Successful enrolment of actors will in many cases be the result of reduction of the networks they represent into a single element of the initial actor-world or vision. For example, InnovatieNetwerk has tried to increase public acceptance of new rivers by enrolling local politicians, assuming they are a representative of the local community. The ‘mobilisation of allies’ is a test of this assumption. Will the networks represented by the representative accept the new roles of their leaders or spokespersons? In his seminal work on scallops in the French St Brieuc Bay, Callon (1986b) shows how initial successful enrolments became contested again when fishermen and researchers no longer accepted the positions of their intermediaries.

In the following sections we explore empirically which mechanisms are important in the translation activities of InnovatieNetwerk in the case of New Rivers and conceptually relate them to the internal niche processes discussed in this section.

3. Methods and data

The case study discusses efforts of the Dutch ‘InnovatieNetwerk’ (www.innovatienetwerk.nl). InnovatieNetwerk has developed a large number of concepts ranging from sustainable recreation to energy supplying greenhouses. The

case study will follow the development of one particular concept, i.e. the concept of ‘New Rivers’. InnovatieNetwerk has developed extensive publication material about the concept since initial ideas were articulated in 2004. Next to concept development InnovatieNetwerk has actively worked on finding local opportunities for concept implementation. Potential candidates were found in Dutch cities and regions including Ooijen-Wansum, Kampen, Arnhem, and the Betuwe. These localized experiments of the ‘New Rivers’ concept will also be analysed in the case.

The data collected for the case study exist primarily of twelve semi-structured interviews with key-stakeholders within InnovatieNetwerk as well stakeholders in the Betuwe and Arnhem. Ooijen-Wansum and Kampen have been documented in earlier research projects (Klijn et al., 2008; Van ’t Klooster & Hajer, 2009). Other sources used include a previous analysis of the working methods and approaches by InnovatieNetwerk published in Dutch by Grin & Van Staveren (2007) as well as publically available material on websites and in public policy documents. Data on the Dutch water management regime and sustainable water management niche has been collected primarily from secondary material and especially from Van der Brugge (2010).

The data was analysed using two types of interpretative categories. The first set of categories is the four translation moments as defined in actor-network theory: problematisation, interessement, enrolment and mobilisation. The second set of interpretative categories is the core processes identified in SNM: expectations, networking and learning. These two sets of categories were combined into a table to analyse the data (table 1). This table also attempts to record information on the initiating actor of a translation moment, the mechanisms or resources that the actor exploits to perform agency, the targeted audience of that agency and case examples.

Table 1. Table for analysis of empirical material

Translation moment	Initiating actor	Mechanisms / resources for agency	Targeted audience	Influence on SNM processes	Case example

4. Case description and analysis

4.1 The Dutch water management regime and sustainable water management niche

Water management has a long history in the Netherlands. With much of The Netherlands situated below sea level, water management has historically played a critical role in politics and technology. Centuries of land reclamation and protection of the low lands from flooding have culminated in a unique and complex socio-technical water management regime.

The 1970s water management regime has been characterised as being technocratic, hierarchical and quite independent of other sectors (van den Brugge, 2010). Water was seen as an enemy that could be controlled by technical means and rigid engineering. Safety was the leading principle in design choices with an emphasis on dykes, damming and normalizing. The Ministry of Transport, Public Works and Water Management and its agency ‘Rijkswaterstaat’ were powerful authorities with a mandate to control and manage the Dutch water infrastructure. At regional level, some 800 local water management authorities were in charge of local water quantity management. The water infrastructure was a sophisticated system of rivers, lakes and canals interconnected through sluices. Water levels had been set at specific levels for specific land uses such as housing, agriculture and industry. Meandering rivers had been normalized for the benefit of shipping, and the floodplains were used for agricultural

exploitation. A wide network of project developers, engineering firms and consultancies supported this regime through research, knowledge development and construction.

Several events and developments have started to change the water management regime since the 1970s. The execution of the Delta Works program triggered public responses from action groups fearing that the closure of estuaries would cause major ecological disasters. In a time of increasing environmental attention in public discourse, a new center-left government ordered the re-evaluation of the closure of the Eastern Scheldt. In the evaluation of three alternatives, for the first time ecological criteria figured prominently next to more traditional economic and safety criteria (van der Brugge, 2010).

In the 1980s important developments included a national debate on how to re-organise a large area between the cities of Arnhem, Nijmegen and Den Bosch, which is crossed by the Rhine, Meuse and Waal rivers. The debate ended in a dead-lock because agricultural and water management interests appeared incompatible. In response, a think-tank organised a contest to develop novel ideas that could re-open the debate. A plan developed largely by authors from 'Staatsbosbeheer' (an organisation commissioned by the state to manage nature reserves) won the contest ('Plan Ooievaar'). The plan proposed a new spatial design for the river region by separating agricultural activities and designating land for spontaneous nature development: the land between the rivers was reserved for agriculture, while the floodplains were reserved for spontaneous nature development (the previous policy was to use them also for agriculture). The plan received considerable attention in the media after a journalist picked it up at a conference and wrote about 'breaching the summer dike in order to allow the river to overflow the floodplains for ecological benefit' (van der Brugge, 2010). Some of the authors started their own consultancy offices including 'Bureau Stromen'. Bureau Stromen played an important role in executing 19 experiments, based on ideas from Plan Ooievaar in the years after. The office also was key to draw InnovatieNetwerk into the sustainable water management niche (see next section).

By the late 1980s ecological thinking and integrative water management had got a strong foothold in Dutch discourse and policy making. The 1989 Nature Policy Plan introduced the idea of an Ecological Main Structure, in which rivers had a prominent role of connecting ecological zones in the Netherlands. It also re-introduced the idea of slow-running side channels in floodplains, which was thought to provide an excellent environment for fish and other species. In the same year, the government published the 3rd national memorandum on water, which perceived water as an integral part of an ecosystems and communities. A year later, the Dutch branch of the World Wildlife Fund combined both ideas in an influential report called 'Living Rivers'.

The good policy intentions were put to a test when in the winters of 1993 and 1995 over 200.000 people had to be evacuated because several dikes were about to break, and a few small villages were flooded. It had major consequences: ensuring safety again became the top priority and sustainable water management temporarily was banished from public discourse. (Schoorlemmer and Verbong, 2010). Immediately, the Large Rivers Delta Plan was launched, echoing the ambitions and scale of the original Delta Plan. In the period up to 2000 more than 700 kilometres of dykes were reinforced. It also led to further international collaboration with France, Germany, Luxembourg and Belgium and several international action plans to reduce the risks involving the Rhine and the Meuse (van der Brugge, 2010).

The international climate change debate, however, put ideas about sustainable water management back on the table. A committee preparing the 4th memorandum on water concluded in 2000 that the water sector was not prepared to meet the challenges of the 21st century, and that the area available for water retention needed enlargement. Parliament supported the conclusions and started a spatial planning instrument called 'Room for the River'. Room for the River guaranteed new safety norms by 2015 in terms of minimal river discharge capacities and focused on broadening and

deepening the river bed. A total of 40 projects are in the process of being implemented to enlarge the space for rivers. Some of them are quite novel experiments such as floating houses in the river bed.

This brief sketch of the Dutch water management regime does not do full justice to all events and actors in its history, and we should be careful in drawing definitive conclusions. For the purpose of this paper, however, two intermediate observations are important. First, important structural elements such as policy discourses and prescriptive policies for sustainable water management have increasingly become part of the regime. Nevertheless, as van der Brugge (2010) argues, 'many of the real physical changes of the room for water discourse are yet to come'. Second, the discourse about sustainable water management shows considerable continuity: from ecological evaluation criteria, to reintroducing side channels and to creating more space for existing rivers. From this perspective, ideas from InnovatieNetwerk about creating new rivers are quite a natural evolution from those previous ideas.

4.2 InnovatieNetwerk and New Rivers

InnovatieNetwerk has been founded in November 2000 by the Ministry of Agriculture, Nature and Food Quality. The Ministry increasingly has to deal with complex, persistent and highly contested issues and problems, e.g. the impact of the bio-industry on the natural environment and issues related to spatial planning. InnovatieNetwerk received a mandate to look for new, innovative approaches and concepts to deal with these kind of issues.

InnovatieNetwerk is, as the name indicates, a network organisation, an intermediary aimed at developing and implementing new innovative solutions. InnovatieNetwerk frames its task as follows: "InnovationNetwork develops radical new concepts in agriculture, agribusiness, food and rural areas and ensures that these are put into practice by interested parties. This involves innovations aimed at sustainable development with a longer-term focus."

InnovatieNetwerk has developed more than 120 concepts covering four themes: 'Creating space'; 'Sustainable enterprise'; 'A healthy society' and 'Innovation stimulating environments'.² This is quite an accomplishment given the size of the organization (about 20 people). The activities of InnovatieNetwerk are twofold: first, they develop a new concept and assess its feasibility in cooperation with a limited number of other actors. A concept has to meet the requirement that it (potentially) contributes to the long term goal of system change. Second, InnovatieNetwerk tries to translate these concepts into real projects.

It was the previously mentioned Bureau Strooming who lured InnovatieNetwerk into the sustainable river management niche in 2003. They approached InnovatieNetwerk to discuss a dilemma that Staatsbosbeheer was facing. Staatsbosbeheer had published a vision on rivers full of ideas about more space for rivers and side channels, but they felt the vision was not taken seriously by government officials. The idea of building New Rivers emerged already in the first phone call between Bureau Strooming and InnovatieNetwerk. In the following years the idea was turned into an elaborate vision.

New Rivers is based on the notion that riverscapes contribute to a number of goals: e.g. biodiversity, recreation and attractive landscapes for housing. As these riverscapes contribute so much, we should construct more, is the key idea behind the New River concept of InnovatieNetwerk. By adding branches and tributaries outside of the existing riverbeds, high quality landscape development also contributes to river security. The New River concept combines river safety, limited housing construction and nature development. While this vision can be seen as a natural evolution of previous ideas within the sustainable water management niche, one thing makes it a much more radical vision: the idea of a

² <http://www.innovatienetwerk.org/en/concepten/>

continuously flowing river, that is really a New River, rather than a back-up provision in case of high water. This has not been attempted in the Netherlands since the 18th century.

Assuming that practitioners would be sceptic on aspects of costs and flow capacity, InnovatieNetwerk allocated considerable resources to calculate different aspects and conceive novel investment strategies. The first New River design to be published was an elaborate and ambitious design of 34 kilometres in the Betuwe region. In the same document, 25 locations in The Netherlands were identified where new rivers could contribute both to landscape quality and river safety. Working closely together with a landscape design agency specialised in riverscapes and well informed about local discourses on riverscape design, five locations were found where river development projects were already under way. For four of these locations, specific designs were made and strategies were devised in order to influence these local discourses.

Simultaneously, InnovatieNetwerk worked to contribute to niche discourses by publishing a book comprising the New Rivers concept and the local variations based on this design. While the book had quite an impact (see later), in general most of InnovatieNetwerk's efforts were related to making a case for New Rivers and trying to get that vision implemented in a number of experiments. This is not to say that InnovatieNetwerk was blind to wider developments in the sustainable water niche or water management regime; on the contrary. With many links to established organisations, InnovatieNetwerk had developed a sophisticated antenna for picking up debates and issues in its areas of expertise. However, trying to translate its vision back into those 'global networks' was less of a priority than developing novel concepts and influencing localized networks to realise them. In other words, InnovatieNetwerk tried to mediate between the global and the local, with a priority given to global-to-local translations. This was their ambition and a strategic decision inspired by limited personal (rather than financial) resources at hand.

4.3 New River experimentation in local contexts

4.3.1 The Betuwe

The Betuwe is an agricultural area between two branches of the Rhine. For two nearby cities upstream along the Rhine, Arnhem and Nijmegen, the Betuwe is an important recreation area. A task force with amongst others provincial politicians had been debating the how and what of a large new park – Park Lingezege – for more than a decade when InnovatieNetwerk marked it as an area of opportunity for a potential New River. Initially, InnovatieNetwerk had calculated the effects of a much longer river along the same route, but for practical purposes they decided to focus on just the section falling in Park Lingezege's borders.

After consulting some external experts on how to approach such a complex planning process, they initiated the formation of a council of local public figures who all felt that a New River in Park Lingezege could give the park and the area a boost. This council attempted to influence the task force, but the task force had finally started to reach consensus on the future development of Park Lingezege. It had been a difficult task, because of the complex location of the park situated between 4 cities. Negotiations had included a range of actors including a number of municipalities and regional agencies, several nature interest groups and the Dutch Ministry of agricultural affairs. The consensus reached consisted of five connected parks, each with a different emphasis on functions and nature. Because of this, the task force was not receptive to the proposed New River, which could potentially open up negotiations and delay park development again. Only when a new provincial representative interested in the alluring prospects of a New River took office there appeared a small opening for the council to propose their ideas for the design of the park. Currently, a 'stand-off' has been agreed upon: the task

force will not make any decisions that will prevent a future construction of a New River; in exchange for this, they have asked InnovatieNetwerk and the council to refrain from further interference in the process for the coming few years, so that the task force can start the construction of the park.

4.3.2 Ooijen-Wanssum

Ooijen and Wanssum are two small towns bordering on the Meuse that were threatened in the 1993 and 1995 floods. To prevent costly floods or evacuations in the future, the province of Limburg initiated a process for the redesign of the riverbed area. Habiforum, a network of professionals in spatial planning, was asked to lead this process. InnovatieNetwerk, which has close ties to Habiforum, was welcomed in the Ooijen-Wanssum process because of its novel ideas concerning spatial planning and how to counter rising Meuse levels.

During this process, InnovatieNetwerk set out to privately talk to many stakeholders in the area and found them interested in the prospect of a New River. People liked the idea of combining nature development with recreation and flood protection, although other alternatives were part of the local debates such as simply raising dyke levels or broadening the existing river. Before anything was decided, however, InnovatieNetwerk published its book *“Bouwen aan Nieuwe Rivieren”* in early 2007, on which it had been working for some time.³ It had a major impact. While the process before had been perceived as open and undecided, the book feels final. It draws exact lines, literally paints the New River in the landscape and gives fixed numbers for housing construction plans to fund the design. Habiforum and local stakeholders did not know that the book was coming and they lost confidence in InnovatieNetwerk because of it. A second issue arose later, when local parties discovered a side effect of the proposed New River: a dramatic lowering of the ground water level of up to several meters. For InnovatieNetwerk this is an issue that can be overcome, for other stakeholders it is a political taboo. The ambitions for a New River have been dropped, but the vision of viewing water as a friend instead of as an enemy has by now permeated the planning process and the newly proposed plan features an elongated new body of water, although it is not permanently running.

4.3.3 Arnhem

Arnhem is a city spanning two sides of the Rhine River. The old city is located on the Northern bank. Newer suburbs have crossed the river. However, the southern riverbank has remained a largely undeveloped, inaccessible terrain. Plans to develop the area have been made for decades, but were recently re-invigorated as a result of the policy that came forth from the 1993 and 1995 floods. In 2007, local authorities started a large participatory design process where everyone with an Arnhem connection – citizens, NGO’s and firms – was invited to provide input for the municipal designers. As part of this process, InnovatieNetwerk created a design based on the New Rivers vision and introduced this idea in the participatory design process. There were two other alternatives being debated as part of the participatory process. A coalition of ‘greens’ aimed to develop the terrain purely as a nature area. Phanos, a large real estate developer, unsurprisingly proposed to construct 5000 houses in the area. In order to convey their vision beyond submission of this plan, InnovatieNetwerk staff aimed to influence local discourse by creating a promotional leaflet, attending meetings and publishing in local media.

Efficacy of InnovatieNetwerk’s efforts cannot be established yet. The municipality’s design division is in the process of creating scenarios on the basis of the participatory efforts. Until these are

³ “Building New Rivers”

presented and a decision regarding the development of the area is made, it remains unclear how much of the New River vision is incorporated in local practices.

4.3.4 Kampen

The same high waters in 1993 and 1995 that initiated so many developments in the Dutch river management, led in Kampen to contemplations over a bypass of the IJssel towards the IJsselmeer to relieve the city from high water pressures in the future. Province, municipality, Rijkswaterstaat and water boards, after consulting with the local population, came up with the idea of a bypass, a permanent but not running body of water that, when water levels were high, would become an extra outlet of the IJssel into the lake by opening up a sluice and allowing the bypass to carry off the surplus water. This compromise was acceptable to all, but it also failed to attract much enthusiasm. When a new mayor was installed, InnovatieNetwerk was asked to give an informal second opinion on whether the bypass plan was the best imaginable solution. InnovatieNetwerk informed the actors that a permanently flowing New River would provide additional benefits over the bypass. In this process, they fulfilled the useful function of independent intermediary, since they voiced the opinion of a share of the actors but were not themselves involved in the process. While much criticism came from water administrators and the more agriculturally minded actors, who adhered other alternatives (such as the bypass) or wanted to stick to the existing situation, this position allowed the discussion to be opened.

4.4 Translations in the New Rivers cases

This paragraph analyses the translation moments, mechanisms and impact on SNM processes in the New River case described above. The results are shown in Table 2.

Table 2: Translation moments, mechanisms for agency and influences on SNM processes.

Translation moment	Initiating actor	Mechanisms for agency	Targeted audience	Influence on SNM processes	Case example
Problematisation, interessement	InnovatieNetwerk	Commissioning local design	Local policy networks	Making local expectations more tangible	All cases, creating a design based on global vision
Interessement	InnovatieNetwerk	Publishing through local communication channels	Broad local networks	Broadening local expectations Communicating global lessons	Publishing leaflet and writing articles for local newspapers and attending participatory meeting in Arnhem
Interessement, enrolment	InnovatieNetwerk	Participating as a local stakeholder	Local policy networks	Broadening local networks Broadening local expectations	All cases, InnovatieNetwerk negotiates acceptance of their vision in local river development networks
Interessement, enrolment	InnovatieNetwerk	Establishing dedicated lobby actor	Local authorities	Broadening local expectations	Establishing a council of local figures to influence local decision making processes in the Betuwe
(response to IN's attempt to) enrolment	Local policy networks	Locals articulating additional	InnovatieNetwerk	Learning and changing global vision	InnovatieNetwerk uses results of negotiations to

The first translation happened early in the process of articulating the New Rivers vision. InnovatieNetwerk assumed local scepticism about both the flow capacity aspects and the financial aspects of the New Rivers concept. In order to be able to counter these arguments and to make expectations more tangible, InnovatieNetwerk committed resources to investigate these issues and

commissions local designs of a new river. The targeted audience are local authorities that have decisive power in deciding upon a new river experiment. In each case commissioning a local design was part of the strategy. In terms of translation moments, the commissioning of a local design is a combination of problematisation and interessement. An InnovatieNetwerk's employee argued indeed that the first step in their strategy is always 'to put the problem upside-down', which is what they did by arguing that increasing water flows is not a problem but an opportunity to create nice new river landscapes. Translating that idea into a local design would then need to interest others for that vision.

Another moment of translation found in the cases was interessement by *publishing through local channels* such as the publication and distribution of leaflets at local stakeholder meetings and articles for local newspapers.

A third mechanism was observed also in all cases. Alongside the commissioning of a local design, InnovatieNetwerk started to participate in local discussions to lobby for acceptance of the vision. As some of the local policy networks start to accept (elements) of that vision this is conceptualised in the table also as a moment of enrolment. In the Arnhem case InnovatieNetwerk was invited by locals to participate:

"We approached InnovatieNetwerk [...] to present their New River concept as part of the local participatory process. [...] Plans like those of the InnovatieNetwerk help participants to look in a different way at a certain area. [...] Next to presenting the plan, InnovatieNetwerk also played a stimulating role in brainstorm sessions."

A fourth translation mechanism also relates to interestment and enrolment and involves lobbying through the establishment of a council of local figures to influence local decision making processes. In the Betuwe, in order to gather support for the New Rivers concept, a translation aimed at both communicating expectations and contributing to local networks. One interviewee described this as follows:

"Because we did not solely want to develop a concept, but also work on implementation, InnovatieNetwerk decided to install a network of local decision makers ('an Entrepreneurial Assembly') that think and advice about actions and create support for those actions."

Although this network initially was thought to be successful, it turned out to be really difficult to put the new concept into practice:

"The Entrepreneurial Assembly hardly has an active role anymore. This is understandable. Their task was not small: spatial development includes so many administrative organisations and procedures; you are dependent on so many people and organisations. Moreover, there was not a situation of crisis in the Betuwe, which results in a limited need for change. Why that is the case is hard to find out. The problem is also that nobody from the locals really put their heart and soul into the New River concept".

Often, these enrolment activities resulted in responses by local actors *articulating additional demands* to state the need for adaptations to be made by InnovatieNetwerk. An example here is the reduction of the scope of the New River in the Betuwe from a 34-kilometre new river to a smaller river part of the Park Lingezen. In general rather than radically changing the vision InnovatieNetwerk made sure to adhere to the vision's radical potential, although local designs 'were allowed' to deviate:

“We use the vision to show people the beauty we can accomplish. We will stick to that no matter what, although we know and accept that the vision can never be realised to its full potential.”

Another interviewee argued:

“Our vision has not been implemented anywhere like we liked to have it. In Ooijen-Wanssum, for example, for several reasons the choice was made to implement an alternative: a river that only flows in case of high water. Of course we rather had seen a New River, but this is already a big improvement over the original plans. We do however very explicitly not call it a New River, because that would degrade our vision”.

Another translation moment occurred in 2007, a precarious time for one of the cases. InnovatieNetwerk published a book on New Rivers in order to stimulate debate within the sustainable water management niche. This caused an inadvertent translation to the local context when it was interpreted as a top down measure to pressure local debate causing *local resistance* against the New River vision. InnovatieNetwerk, however, saw this response as a positive measure of good timing:

“The New River book came later than originally planned, but precisely on time to land in the local discussions in Ooijen-Wanssum. We even had to do some repair work, because people did not understand that it was a vision rather than a ready-made plan from the Dutch government.”

In another case (Betuwe), resistance was subtler:

“Our plan was not received very enthusiastically, I think because they experienced it as an external interference. But they did not put it like that. Instead, they came with new arguments all the time why the plan was not feasible. We could easily refute those, but that hardly changed the dynamics.”

4.5 Case conclusions: reflection on current and future situations

The current situation regarding New Rivers is at best ambiguous. InnovatieNetwerk has come far in developing and articulating their vision. They have acted upon various perceived local opportunities to start the process of actually developing New Rivers. A rich pallet of mechanisms and ways of working has been developed and exploited for this cause. At the same time, no new river has been established yet. Local actors have been taking notice of the vision of InnovatieNetwerk, and in some cases, embraced part of it, but the vision was also contested and raised criticism and resistance. In terms of translation, it seems InnovatieNetwerk has come halfway. Currently, one can argue that InnovatieNetwerk has been successful in providing an alternative *problematization* of rising water levels by emphasising the benefits of water rather than the risks. InnovatieNetwerk has also been successful in creating *interessement* among local actors through a variety of mechanisms and actions. However, InnovatieNetwerk has not yet been able to *enrol* sufficiently local actors nor has it been able to ensure positive *mobilisation* of the wider networks that are represented by the directly involved actors.

The future of the New River niche is uncertain. From a translation and actor-network perspective one can argue that the strategy deployed by the InnovatieNetwerk has been fruitful until now. They are halfway and could very well continue what they are doing by trying to realise successful local enrolment and mobilisation. The complexity of the water regime and sustainable water niche in the Netherlands, however, makes it unlikely they will be successful. Indeed, the existence of alternatives in various cases, the multitude of actors and interests, and the perceived size of the problems and risks

are considered much larger compared to cases that InnovatieNetwerk has been argued to be successful in, such as the development of a vision on an energy generating greenhouse.

Hence, despite its ambitions and strategic decisions, other strategies may need to be considered in InnovatieNetwerk's pallet of working methods. Here the Strategic Niche Management and Multi-Level Perspective might provide inspirations. One additional strategy would be to focus much more on niche networking and learning rather than local implementation. This would include pro-actively searching for allies and professionals in the field of sustainable water management and try to translate them into allies for the New River vision. A related strategy would be to actively start trying to move the existing regime of water management in the Netherlands to start incorporating some of the elements propagated by the sustainable water management niche. In both cases, InnovatieNetwerk's could build upon their existing wider networks to do so. However, both strategies would also have practical consequences for their ambitions to combine vision development with action, given the size of this organisation and their limited personal resources.

5. Discussion and conclusions

In this article the case of the Dutch InnovatieNetwerk was introduced to illustrate empirically how a concept from actor-network theory, translation, could be useful for bringing agency more to the foreground in SNM studies distinguishing between local experiments and global niches. The following conclusions can be drawn.

First, the activities of InnovatieNetwerk show indeed several moments of translations between the sustainable water management niche and local experiments. More specifically, ideas about sustainable water management have evolved from ecological evaluation criteria, to reintroducing side channels and to creating more space for existing rivers. InnovatieNetwerk's New River innovation is a specific and quite radical one, but evolutionary connected to these previous ideas in an emerging niche of sustainable water management. InnovatieNetwerk 'only' had to recombine these ideas in a novel design, and try to mobilize local places for implementation.

Secondly, we put 'only' between quotation marks, because it involves considerable agency to do so. Building upon Smith (2007), this article uses the concept of translations to investigate agency and bring more to the foreground the complexity and chaos in Strategic Niche Management in practice (Lovell, 2007). In this way, this study supports some of our previous work (Geels and Raven, 2006; Raven et al, 2008) that interactions between local experiments and global niches are not self-evident and do not take place in a linear way. Instead, they take much effort, happen continuously and suffer from regular relapses. Using the four moments of translations, however, allowed us to investigate these processes more systematically. In fact, the case suggests an intriguing relationship between the moments of translation and the three SNM processes of articulating expectations, networking and learning. Problematisation translates previous experiences and perceived opportunities in the wider context into a new expectation. Interestement translates that expectation into networking activities. Enrolment means that actors truly accept their new position in the network and start a process of experimenting and learning. Mobilisation might translate the lessons into wider niche and or regime networks.

Third, the combination of translation moments and the niche perspective proved to be useful in understanding the case. Indeed, the four moments of translation allowed us to conclude that InnovatieNetwerk has come halfway translating the concept of New Rivers into a physical reality. The niche perspective allowed us to argue that while InnovatieNetwerk can choose to continue trying to translate local actors, it could also choose to broaden their strategies and try and translate more pro-

actively other niche-actors (rather than local players) or regime actors into their portfolio of working methods.

Fourth, this study contributes by empirically exploring translation mechanisms in global-local interactions. We found six mechanisms: commissioning local designs, publishing through local communication channels, lobbying, participating as a local stakeholder, locals articulating additional demands and local resistance. These mechanisms differ in terms of translation moments, initiating and targeted actors and the impact on SNM processes. Because these mechanisms are based on a single case study they cannot be considered exhaustive, although we expect the conceptual relationship between SNM processes and translation moments to be valid more generally. Future research could focus on cross-case analysis to identify mechanisms in different contexts and identify which mechanisms are successful in which contexts.

Finally, an interesting question is how the local-global distinction relates to bottom-up/top-down approaches in the governance of transitions. While this question is beyond the scope of this paper, it is interesting to note that scholars such as Verheul and Vergragt (1995), Lovell (2007), Seyfang and Smith (2009) and Monaghan (2009) shift focus from governments as niche managers to the role of civil society and NGO's in initiating bottom-up solutions for sustainable development. Indeed, these approaches seem to be different from the case in this paper, in which governments are very much involved in shaping a global niche (section 4), perhaps not strange given the strategic relevance of water management and scale of 'experiments' compared to, say, fridges and wind mills (Vergragt) or sustainable houses (Lovell). But although empirically this paper has emphasised top-down government's activities over bottom-up grassroots initiatives, conceptually the local-global perspective embraces both.

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REFERENCES

- Callon, M., 1986a. The Sociology of an Actor-Network: The Case of the Electric Vehicle, in: Callon, M., Law, J. Rip, A. (Eds), Mapping the Dynamics of Science and Technology. Macmillan Press, London, pp. 19-34.
- Callon, M., 1986b. Some elements of a sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay. In Law, J. (Ed.). *Power, action and belief: a new sociology of knowledge?* London: Routledge, 196-223.
- Geels, F.W., 2002. Technological transitions as evolutionary reconfiguration processes: a multi-level perspective and a case-study. *Research Policy* 31, 1257-1274.
- Geels, F.W., Raven, R.P.J.M., 2006. Non-linearity and expectations in niche-development trajectories: ups and downs in Dutch biogas development (1973-2003). *Technology Analysis & Strategic Management* 18 (3/4), 375-392.
- Grin, J., Van Staveren, A., 2007. Werken aan systeeminnovaties: lessen uit de praktijk van InnovatieNetwerk. Van Gorcum, Assen.
- Kemp, R. Schot, J.W., Hoogma, R., 1998. Regime shifts to sustainability through processes of niche formation: the approach of strategic niche management. *Technology Analysis & Strategic Management* 10 (2), 175-195.
- Klijn, E.H., Van Buuren, A., Edelenbos, J., 2008. Kampen-IJsseldelta: Hoe ambities elkaar kunnen versterken. Concept Report (Not Published)
- Markard, J., Truffer, B., 2008. Technological innovation systems and the multi-level perspective: towards an integrated framework. *Research Policy* 37, 596-615.
- Monaghan, A., Conceptual niche management of grassroots innovation for sustainability: The case of body disposal practices in the UK. *Technological forecasting & Social Change* 76, 1026-1043
- Raven, R.P.J.M., Heiskanen, E., Raimo, R., Hodson, M., Brohmann, B., 2008. The contribution of local experiments and negotiation processes to field-level learning in emerging (niche) technologies. Meta-analysis of 27 new energy projects in Europe. *Bulletin of Science, Technology & Society* 28(6), 464-477.
- Rip, A., Kemp, R., 1998. Technological change. In: Rayner, S., Malone, E.L. (Eds.), *Human choice and climate change*, Vol. 2. Batelle Press, Columbus, OH, 327-399.
- Schoorlemmer, N. and Verbong, G., 2010, Collective memory in action: understanding the Dutch river policy. Working paper.
- Schot, J.W., Geels, F.W., 2008. Strategic niche management and sustainable innovation journeys: theory, findings, research agenda, and policy. *Technology Analysis & Strategic Management* 20 (5), 537-554.

Seyfang, G., Smith, A., Grassroots innovation for sustainable development: towards a new research agenda. *Environmental Politics* 16(4), 584-603

Smith, A., 2007. Translating sustainabilities between green niches and socio-technical regimes. *Technology analysis & strategic management* 19(4), 427-450.

Van der Brugge, R., 2010. Transition dynamics in social-ecological systems. The case of Dutch water management. Erasmus University. PhD thesis.

Van 't Klooster, S., Hajer, M., 2009. Visie voor de Regio: Evaluatie (Voor)verkenning Gebiedsontwikkeling Ooijen-Wanssum. Not Published

Verheul, H., Vergragt, P.J., 1995. Social experiments in the development of environmental technology: a bottom-up perspective. *Technology Analysis & Strategic Management* 7(3), 315-326