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Consumer-inclusive innovation strategies for the Dutch water supply sector: Opportunities for more sustainable products and services

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ABSTRACT

This article reflects on the consequences of contemporary shifts in the relationships between water utilities, their competitors and domestic end users. Such changing relations come along with the development of new more sustainable products and services. By distinguishing between 'upstream' vs. 'downstream' and 'core' vs. 'non-core' innovations in water supply, a conceptual tool was developed and applied to analyse innovations in the Dutch water supply sector both from a provider and a consumer perspective. To assess the role of (eco)innovations in the Dutch water supply sector, the paper reviews current trends in water consumption; consumers' perception of water services and contemporary innovation strategies of water supply companies. Based on focus group discussions with both water professionals and water consumers, new roles and products for Dutch water supply companies were identified. It was shown that there are fits as well as misfits in the ways in which providers and consumers tend to look at the future of sustainable water supply. Knowing about and relating to consumer preference and practices can be instrumental for water providers when developing new products, services, images and roles.

1. Introduction

Water utility managers in many Western European countries are developing a stronger orientation on what was previously termed 'the demand side' of the water chain, which points to the beginning of what Featherstone [1] has called a 'consumerist turn'. In the United Kingdom, in 2005–2006, UK Water Industry Research (UKWIR) organized a series of workshops to reflect on trends in the British water sector. Utility managers and social scientists together discussed the role of water users vis-à-vis water service providers. Questions addressed included whether water users could best be conceived of as the consumers of commodities or as citizens entitled to a public good. Should water managers share a responsibility with end users for consumption practices as they tend to happen 'downstream',[1] beyond the meter? And what about involving citizen–consumers with upstream processes, making transparent the costs involved with climate proofing? In the workshops, ways of innovation, new products and viable strategies for the future were discussed that would help to adequately deal with the consumerist turn.

Similarly, within the Joint Research Programme of the Dutch Water Supply Sector, research has been carried out on the added value of consumer-oriented innovations for Dutch water supply companies. Some utility managers observe that consumers, in spite of the high service level provided by the Dutch water supply companies, are becoming increasingly critical and demanding for example with respect to the sustainability performance of industries. Water companies are now confronted with the challenge to make the shift from just being a water supplier towards becoming a customer-oriented service provider with a high sustainability profile and a 'licence to deliver'.

The emphasis on consumers or citizens as end user of utility products and services fits into a broader pattern of change taking place in utility sectors in many European countries. Whereas, until the 1980s most utilities in western countries were publicly owned and provided uniform services to captive consumers, making water a low involvement and low-cost product [2], nowadays this uniformity is dissolving due to liberalization of utility markets and private participation in utility service provision [3,4]. The provision and consumption of utility services now take place within the context of splintering or differentiating networks, linking consumers and providers in various ways [5,6]. Such changes in services, their modes of provision and their implications for consumer lifestyles have also been conceptualized in literature on water utility management and water consumption. In this literature, one can witness a conceptual shift from the predominant use of supply-side terms (cubic metres, num-

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E-mail address: bas.vanvliet@wur.nl (B.J.M. van Vliet).
[1] The distinction between 'downstream' and 'upstream' actors and processes is used to refer to the consumer and the provider end of the water chain respectively.

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bers of connections, security of supply) towards a new language including end users, lifestyles, demand side management and the need for developing corresponding consumer-inclusive strategies [7–10].

Against this background we address two questions. First, is it possible to detect a shift from supply-side thinking towards more consumer-inclusive innovation strategies in the Dutch water supply sector? Second, how and to what extent do *more sustainable* products and services fit into and help shape the strategies of water providers? As treatment of these questions in academic literature is relatively new, we have chosen for an in-depth exploratory analysis of a single case: the Netherlands. Section 2 introduces the Dutch water supply sector, its main actors, strategies and orientations. In Section 3 we present a conceptual tool developed to analyse the dynamic changes in the relationships of water supply companies with their competitors and with their domestic end users in particular. Having outlined this conceptual frame, we shortly discuss the methods for data collection (Section 4) and then go on to report on the empirical research with respect to the *current* position of Dutch water supply companies and their contemporary (business) opportunities and risks (Sections 5 and 6). Section 7 discusses the next step in our empirical work. We then take the analysis one step further by identifying potential *new* roles for Dutch water supply companies with respect to (sustainable) service provision for their consumers in the near future. In the concluding section we discuss the differences among the ways in which consumers and providers conceive innovation and water provision.

2. The Dutch water supply sector

2.1. Position and activities of Dutch drinking water supply companies

The Dutch water sector includes the activities and organizations involved in the supply of drinking water and those involved in urban drainage and treatment of wastewater. Together, these organizations are referred to as the 'water chain' [11]

The Dutch water industry is characterized by a sharp institutional and probably also cultural divide between water supply companies responsible for water extraction and water supply, municipalities responsible for wastewater collection and Water Boards responsible for wastewater treatment [12,13]. This paper focuses on water supply companies only.

Water supply companies' core activity is to supply piped drinking water. For this purpose, groundwater (60.3%), surface water (38.6%) and water extracted from dunes (1.1%) is used [14]. Besides, water companies sell industrial water to market parties, deliver 'grey' water (water of a lower quality than drinking water) to some households and small and medium-sized enterprises (SME) and provide some water-related services (e.g., laboratory services, billing for third parties, environmental protection and nature conservation).

Since 1976, Dutch water supply companies have been owned by municipalities and provincial governments, but have been managed quite autonomously [12]. The water supply sector has an umbrella organization (VEWIN), serving as the liaison between the water companies and the national policy community. Over the past few decades, we have seen an ever increasing level of scale at which water supply companies operate, marked by a decrease in the number of water supply companies (from 55 to 10 over the period 1990–2007) and a 40% decrease in the number of fulltime jobs in the water sector [14]. With some exceptions, collaboration between water supply companies, other parties in the water chain or other utilities is relatively limited. Policy makers at the national level, together with most actors in the water chain, favour a bottom-up approach regarding collaboration between water chain companies.

At the beginning of the 21st century, water supply companies were explicitly denominated as 'environmental companies' whose crucial tasks would best be organized through a public mode of provision [15]. Dutch parliament took this decision notwithstanding the high pressure put on the water supply companies by a broader liberalization agenda pursued by the Ministry of Economic Affairs. At the time, steps towards liberalization had already been taken in the electricity and telecommunications sectors, while two major energy companies developed an orientation towards multi-utility liberalization and privatization [11]. Partly as a means to induce market principles within their public mode of provision, the Dutch association for water supply companies voluntarily developed a benchmark, comparing 'water quality', 'environment', 'finance and efficiency' and 'service quality' amongst its members [16]. The recent Dutch Drinking Water Act, issued in 2009, reconfirmed the current public position of the Dutch water supply sector, whereas liberalization and collaboration or mergers between 'water chain' partners seem no longer very prominent on the political agenda.

2.2. Water consumption and consumer trust in the Netherlands

Domestic water consumption accounts for 60–70% of total water consumption with an average family household consuming 127.5 l per person per day [17]. When viewed over the longer term, an initial increase in the volume of water delivered (from 300 million m^3 in 1950 to 1166 million m^3 in 1990) has been followed by a gradual decline to 1099 million m^3 in 2006. A decrease in per capita consumption has been partly offset by an increase in population size and more frequent periods of drought [17]. Water consumption is price and income inelastic. The quality of the tap water is generally comparable with that of bottled water and sometimes both are even derived from the same source. With 19 l per person per year the consumption of bottled water is relatively modest (www.milieucentraal.nl). Bottled water on average costs 400 times as much as tap water [11].

The Dutch water supply companies produce drinking water that meets the highest quality standards with regard to safety, quality and security of supply. Various benchmark studies indicate that, with the exception of some complaints concerning its hardness level, most consumers are positive about drinking water quality [16]. In 2006, Dutch consumers ranked the performance of their water supply company higher than the performance of postal services, retailers, energy companies, their municipality and public transport organizations [16]. A recent survey confirmed this high degree of consumer trust in water supply companies (in terms of the high marks given and the low number of complaints) and the water they produced [18]. The same survey showed that more than 50% of the respondents, especially medium and higher educated people, are interested in 'socially responsible projects' organized by water companies such as development aid and nature conservation.

3. Providing more sustainable products and services for domestic water-practices

3.1. Differentiation and (environmental) innovation in the drinking water sector

The broader process of differentiation in utility services mentioned in the introduction can also be observed in the Dutch water supply sector. An example is the provision – at the end of the 1990s – of so-called household water. Via a second piped water system water of a quality 'lower than drinking water' was provided to households in a number of newly built residential areas. At the end of the 1990s several experiments with household water (in six new residential areas) were carried out. In 2003, it was concluded

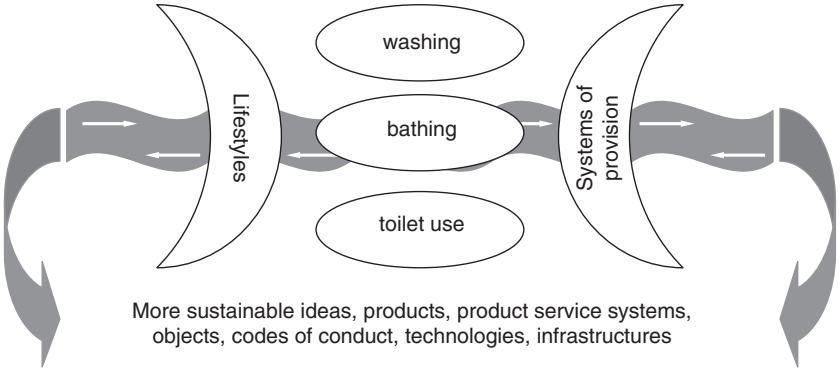

Fig. 1. Innovation within social practices of domestic water consumption.

that the environmental gains did not outweigh public health risks and costs, so Dutch parliament decided no longer to tolerate the large-scale delivery of household water. Nevertheless, the household water projects were important as they marked a breakthrough in the so far uniform supply of tap water to all households. Also rain water appliances have gradually found their way into Dutch households, with the consent or co-operation of water supply companies [15].

Along with a differentiation in the supply of water by companies and other providers, the roles of consumers towards water service providers are changing. End users of water services are no longer the captive consumers of uniform products delivered under fixed circumstances. Nowadays they are offered the possibility not only to choose between different products and services but also between different kinds of roles and relationships with their providers. The provision of rainwater systems and infrastructures might serve as an illustration. As consumers of water, end users have the option of purchasing individual appliances for rain-water capture and use in their private households. Next to this consumer role, they can as well assume an active role as citizens, supporting and sometimes initiating house-on-site rainwater systems. As co-constructors of new infrastructures, they help establishing support for water innovations and demand these systems to be delivered (and subsidized) by their municipality or housing association. Finally, as regards 'ethical or political' consumers acting upon the perceived moral obligation to make water consumption practices worldwide more sustainable, they can lend support to water initiatives as developed by their 'local' providers in other parts of the world. These examples illustrate the different roles and commitments of end users in processes of innovation in the water sector.

Now that the captive consumer has dissolved into multiple roles and water provision has become a more varied phenomenon, it is necessary to further investigate and specify what water provision and consumption is all about. To make possible a more elaborate analysis of water provision and consumption, in the next section we turn towards the social sciences. As we shall argue, especially within sociology some interesting ideas and concepts have been developed, enabling a better understanding of the provision and use of drinking water.

3.2. Water consumption as social practice

To analyse the relationships between utility companies and their customers the social practices approach (e.g., [4,19–21]) as developed within the sociology of consumption in particular, seems to be highly relevant. As indicated in Fig. 1, social practices are shaped through the dynamic interplay between systems of provision (including utilities, legislation, material infrastructures) on the one hand and the lifestyle characteristics (attitudes, knowledge, expectations) of citizen–consumers on the other. For the purpose of understanding water provision and consumption, the social practice approach is relevant since it implies investigating water-related consumption practices both from a consumers' and from a providers' perspective. So far, the approach has been applied to the study of innovation in water practices, looking into the ecological modernization of domestic water consumption practices [22] in particular.

The social practices approach highlights the fact that consumers are involved in different domestic water practices such as washing, bathing and toilet use. Water-based consumption practices can only be understood when taking into account consumer concerns and expectations, which are often practice-specific in nature. Showering, washing and toilet use are framed differently by consumers, as are the innovations made available to them for making these practices more sustainable. It also becomes clear that domestic water practices operate within the context of existing material infrastructures and conditions. These systems of provision also take a different shape, depending on the social practices under study. The practice of washing is served by different providers and under different regulations compared for instance with the practice of rainwater (re)use.

From a providers' perspective, water supply companies are confronted with a number of other providers (bathroom manufacturers, energy companies) depending on the kind of water-based consumption practices under study. Because of the other actors in the system of provision, water supply companies cannot autonomously 'steer' the development of water-based consumption practices in a certain direction: through their very presence, the other actors co-determine future courses of events. In some countries (with the UK as a prominent example) there is direct competition going on among different water actors in the water-supply system. When offering innovations related to specific domestic water practices, water companies have the choice to either collaborate with other (also non-water sector based) service providers or to offer water innovations to the customers by themselves.

Because sustainable development has become an important issue also for water companies, they must decide upon their overall environmental orientation, in particular the environmental profile they want to develop in relation to competitors and customers. As Spaargaren and van Koppen [23] suggest, the orientation towards consumers is a constitutive element for building company strategies regarding sustainable innovation. When developing more sustainable provision strategies, companies have to take into account the practices and lifestyles of downstream actors, besides upstream actors and processes. Nowadays almost all major companies develop a communication strategy towards consumers and the wider society as part of their environmental strategy. Information exchange can refer to the environmental impacts generated at the upstream and at the downstream ends of the water supply chain.

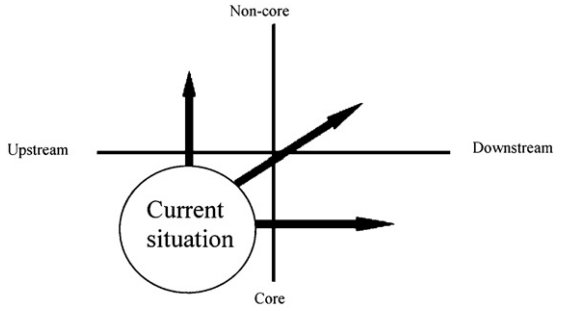

Fig. 2. Innovation challenges for Dutch water supply companies.

Companies may decide differently about the kind of information they want to share with consumers and about their specific ways of communicating with end users. On the low end of the spectrum they can decide to restrict information provision to just the companies' internal, environmental practices. This minimum level of information provision is often prescribed by law. On the upper, pro-active end of the spectrum, companies can choose to engage in an open, active dialogue with citizen–consumers about upstream and downstream environmental impacts and improvements. In the most advanced cases, the subject of the dialogue is no longer restricted to environmental impacts of water consumption proper but extended towards a broader debate on the need to arrive at sustainable lifestyles and the ecological modernization of patterns of (water) consumption [24].

3.3. *Upstream vs. downstream and core vs. non-core innovations*

Based on the theoretical discussion and the conceptual framework as presented, we distinguish two kinds of strategic choices water supply companies are confronted with nowadays. First, water companies have to decide whether and to what extent they wish to make a connection with their customers, these customers' water consumption practices and their related values and preferences. If an active strategy is opted for, lifestyle oriented target group segmentation (in so far as this is possible within the current constellations in which water companies only serve captive consumers) may become relevant. The traditional conceptualization of water consumers as a homogeneous group of 'connections' is left behind and reframed in terms of a (lifestyle based) division or segmentation of customer–consumers. When offering (more sustainable) innovations, strategies are based upon an assessment of the fits and misfits of these innovations into the water practices as enacted by different lifestyle-groups.

Second, water supply companies must decide about the kind of activities they wish to include in their future portfolio. These new activities can relate to both the hardware and the software of water provision: to new qualities and combinations of water flows, products and services as well as to information, images and ideas about water consumption. Also in this respect, the strategies of water providers might show different emphases. Water companies can choose to restrict themselves to innovations directly related to the core business of providing just water or, alternatively, to enter new fields of business that are only indirectly related to the water sector and its traditional concerns.

Combining these basic strategic choices into one scheme, we identify four directions (upstream/core, downstream/core; upstream/non-core and downstream/non-core) into which water supply companies can orient themselves when thinking about their innovation strategies and the role of eco-innovation therein (Fig. 2).

With the distinction between 'core' vs. 'non-core' activities on the one hand and 'upstream' vs. 'downstream' activities on the other, we are able to sketch the playground for innovations as well as for the (re)-orientation of the strategies of water supply companies towards consumers. In each quadrant we can place different innovations and new roles for water supply companies. In line with our practice approach the provider–consumer (P ⇔ C) relationship is given separate attention, since water provision can no longer become organized 'behind the back' of consumers: they expect to become informed and involved when relevant. Consumers want to become connected to the actors in the system of provision behind their water consumption practices provided that these actors or companies are willing to 'translate' the relevant information to them in terms of their life-world and consumption rationality.

As a consequence, innovation (I), forms of consumer commitment and involvement (C) and provider-strategies towards consumers (P) are investigated in their mutual connectedness. With the help of the conceptual model, it is possible to specify the ways in which consumer perceptions and behaviours are taken into account in the strategic positioning of water providers. Confronting the perceptions and behaviours of end user concerning (more sustainable) water provision proved to be of strategic importance [8]. These perceptions and behaviours inform water providers not just about the general level of support for innovation but especially about the potential (mis)fits of the innovations with the existing lifestyles and water consumption practices of their customers.

For the purpose of our present study, we use the scheme of Fig. 2 in two different ways. First, we empirically scrutinize and fill in our conceptual scheme by analysing a number of *current* innovations [24] in domestic water consumption together with the concomitant roles that Dutch water supply companies play in these innovations. Second, the scheme is used as an analytical tool to identify, discuss and elaborate potential *future* innovations as well as new roles for Dutch water supply companies. Before reporting on the empirical findings, the next section briefly clarifies the methodologies used to organize the empirical research.

4. Methodology

Because of the exploratory nature of our study we used a qualitative research approach. We started with a desk study resulting in an inventory of current innovations in water-based consumption practices and concomitant changes in consumer–provider relations. This inventory, carried out in 2008, included innovations in which Dutch water supply companies were actively involved (as initiators or participants) but also innovations that were predominantly carried out by other actors at the supply side. The results of this desk study were presented and discussed in a focus group with consumers (in June 2008) and one with providers (in October 2008). This combined desk-research and focus group method enabled us to validate the conceptual tool developed in the previous section and served as input for the next step in our empirical research. This next step refers to the efforts to identify – in consultation with marketing professionals of water supply companies – potential new activities and new roles for water supply companies.[2] These strategic innovations were subsequently discussed (in March 2009) with a new consumer focus group. The participants were asked about their opinion on *new activities* and on *potential new roles* for their water supply company.

Previous research on preference assessment in the water sector has shown that focus group discussions are an appropriate method to identify and validate consumer preferences [24]. The choice for the focus group method also fits within the theoretical approach of using social practices as key units of analysis since meanings and rationalities with respect to water-based consumption prac-

[2] A pre-selection of strategic innovations was made during the desk-study research.

tices are constructed at the group level and in interaction with participants. Characteristic for our approach is that we analysed current and potential future developments from a providers' and from a consumers' perspective iteratively. We chose to have separate consumer and provider focus groups to not only identify but also contrast consumer and provider rationalities. Both consumer groups represented the customers of three different water supply companies, and its participants were selected with the help of various social and economic criteria.[3]

5. Current innovations in domestic water consumption

5.1. Flows, products, services and existing profiles of water providers

The inventory included innovations in water, information and financial flows to households, in products and services, and in the images and narratives that various providers use to position themselves [24]. In this way 'core' as well as 'non-core' activities entered the picture and provided insights into the nature of provider–consumer relations. Whereas the discussions on water saving and household water (Section 2) can be situated at the end of the 1990s, most of the developments reported in the current section only became prominent in the first decade of the 21st century. The list presented below is not exhaustive but serves to organize a short discussion and some relevant examples for each major category of the analytical scheme.

5.1.1. Innovations in flows

Water flows. Dutch water supply companies still have the monopoly on tap water delivery. However, other providers (e.g., some energy companies) buy cold tap water from water supply companies, heat it in community on-site systems and supply hot water to households. Besides, there are various providers of products and services (water-softening devices; water filters; water coolers; providers of bottled water) who do not always supply drinking water themselves, but whose products and services do influence the service of water supply companies;

Information flows. Water supply companies' annual reports illustrate that the consumer is occupying a more central role in the information flows between the water supply system and its consumers. Consumers expect that more information is accessible. At the same time, water supply companies and other actors (e.g., suppliers of hot water) have become more pro-active in supplying information to their customers, partly for reasons of inter-provider competition;

Financial flows. Within the water supply sector, the emphasis lies on efficient corporate management and low consumer tariffs. Other actors, predominantly governments at different levels, initiate shifts towards other modes of metering and billing [25]. Tension can be observed between conceptualizing water as a commodity (use more if you pay more) vs. water as an environmental and public good (e.g., water saving and lower tariffs for various groups of consumers).

5.1.2. Innovations in products and services

Wellness. A trend towards wellness is reflected, amongst other things, in increasing purchase patterns for luxurious bathroom equipment (comfort showers, whirlpools). Consumer surveys show that this equipment is nowadays increasingly being installed and used, causing per capita water consumption to increase for the first time since the early 1990s [17]. This trend may indicate that in the 21 st century the price- and income-elasticity of water consumption can no longer be taken for granted;

The provision of health-related products and services (providing bottles of water during sports events; water machines at offices and secondary schools, etc.);

A shift towards innovations promoted as 'luxury' or 'convenience' (taps supplying boiling water; the installation of complete kitchens in the garden, etc.);

Innovations related to sustainability or corporate social responsibility. This category includes, but is not limited to, the financial involvement of consumers in water and sanitation projects in developing countries, providing educational materials for primary and secondary schools, and organizing guided tours at water supply companies.

5.1.3. Existing profile of water providers when it comes to innovation

Dutch water supply companies differ according to their extent of employing 'non-core' activities besides their core business. Some companies employ (predominantly health-related) non-core activities, whereas other stay very close to their conventional core business. Sometimes, water supply companies choose a pro-active approach in positioning themselves vis-à-vis other providers. They report having to decide between initiating, co-operating, critically following or even opposing innovations. When new activities are developed, this is mostly done with the help of innovations upstream and close to the core business of water supply companies. With regard to activities downstream and further away from the water supply companies' core business, often a more passive stance of water providers is reported.

5.2. Focus groups on current innovations and provider strategies

5.2.1. Consumer focus group discussion

The results of the inventory of current innovations in domestic water consumption served as input for a focus group discussion with consumers and one with providers of water-related products and services. It turned out that consumers associated 'domestic water consumption' with specific water-consuming activities. Participants indicated that they paid most attention to 'whether the water used is clear and clean' and 'whether it has the right temperature'. Most consumers think that for drinking and showering, water of drinking water quality would be needed, whereas for other activities this would not be the case. Consumers spontaneously mentioned that they deemed water saving important. As they indicated, this knowledge was obtained from the rigorous water-saving campaigns of the 1990s (by the Dutch Government together with the water supply sector) and from visits to countries with a drinking-water situation less favourable compared with the Netherlands. Confronted with some of the innovations discussed in the previous sub-section, a tension became visible: consumers indicated that they would like, for instance, a whirlpool or a water-softening device if they could afford it. But at the same time they showed worries about the environmental consequences of these innovations (predominantly framed along energy and climate storylines). Looking at where the consumers position their water supply company, they see it as a governmental agency with 'some characteristics of an NGO protecting a global resource'. The majority of the discussants thought that their water supply company should focus on water, water quality and water saving, not on other issues. The overall consumer perception of water supply companies' activities and roles was mostly positive. The water company is trusted in accomplishing secure supply of high-quality drinking water.

[3] Included were: men (6) and women (6); inhabitants of private houses (7) and rental apartments (5); inhabitants of cities (7) and villages (5); people with higher (6) and people with lower (6) education level; people whose parents were born in the Netherlands (7) and people with at least one parent born outside the Netherlands (5).

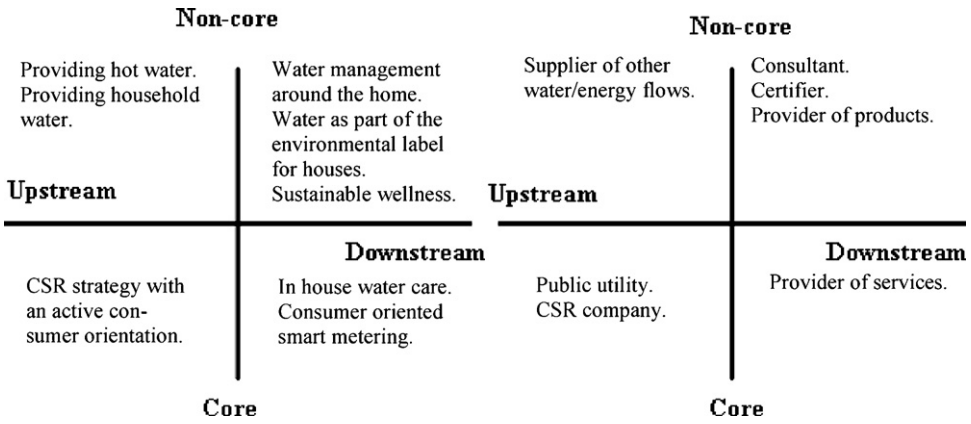

Fig. 3. Potential innovations (left) and the associated roles (right) for Dutch water supply companies.

5.2.2. Provider focus group discussion

In the provider focus group, the results of the discussion with consumers were presented to a group of water service providers, including water supply companies, retailers of sanitary equipment and water coolers, and an architect. The participants deemed the results of the consumer focus group in line with their own experiences. Especially the providers other than the water supply companies indicated that water companies' activities 'have to stay close to their core competence'. All participants recognized the observed tension of consumers between their wish for luxury and comfort vs. their concern for environment and climate issues. The participants agreed that 'water supply companies in the Netherlands are doing a good job' in reliably providing safe drinking water to consumers.

The representatives of the water supply companies wanted to broaden their company portfolio in order to (1) create extra market opportunities[4] and (2) to realize 'surplus value'. They saw as the main bottleneck for (environmental) innovation that 'water is a low-interest product, amongst other things because of the relatively low costs'. A provider of bathroom equipment indicated that water supply companies should be careful in 'providing products and services that are too far away from their core businesses because water companies would not be fitted for it'. He was particularly referring to after-sales activities of which water companies have neither experience nor capacity. According to the 'non water company' providers, most market opportunities for the water companies would be related to diversification in flows and flow-related technologies (e.g., supplying different water flows with different qualities; smart metering). The delivery of hot water to households was considered a potential niche market by all participants.

From this provider focus group discussion the picture arose of a water supply sector with many intentions for providing services in new areas (also downstream and non-core). The water company representatives indicated that they are confronted with a number of constraining factors, including (1) regulations by the central government that do not allow the delivery of commercial services to consumers; (2) consumers for whom water is a low-interest and low-involvement product; and (3) the limited possibilities that exist in the Dutch water supply sector for inter-provider competition. Generally acknowledged was the risk that water companies loose contact with their end users: if energy companies would start to supply hot water on a larger scale, this would lead to 'further reduced visibility of the water company, and potential image problems', resulting in water companies ending up at greater distance from actual domestic water consumption practices and water consumers.

6. Portraying the current challenge for the Dutch water supply sector

So far we have illustrated the special place of water in the dynamic and quickly evolving landscape of providing energy, water and waste-services at the domestic level. On the one hand, water is the most classic, regulated and protected of all network-bound services. On the other hand, water is widely regarded as a high-profile commodity, and various water-based consumption practices enable providers to develop highly conspicuous consumer-oriented innovations. So it is not surprising that various providers try to 'hi-jack' the water supply companies' monopoly. We have documented some of the shifting power relations (e.g., between water and energy companies) and observed that water companies seem to be relatively powerless vis-à-vis other providers. Water supply companies believe that they have to take action, given the current dynamics of service provision to households. However the current power constellation does not stimulate (nor enable) water supply companies to become more innovative or to strengthen their consumer orientation. This raises the question of what potential innovation strategies water supply companies might develop given their current position vis-à-vis consumers and other providers. This question will be addressed in the next section.

7. Exploring strategic innovations and future roles for Dutch water supply companies

7.1. Perspectives of the water industry

In October 2008, a discussion meeting with water supply companies' marketing professionals was organized to explore possible innovation routes for water companies. Based on the scheme of Fig. 3, participants were asked to bring up for each quadrant some strategic innovations. This resulted in the eight innovations displayed in the scheme at the left part of Fig. 3. It became clear that water supply companies envisaged various new roles related to these (and other) innovations, including those of becoming 'supplier of other than merely plain water flows', 'consultant/advisor', 'certifier', 'provider of extended services', 'provider of (eco) products', and a 'Corporate Social Responsible (CSR) company with an active consumer orientation'. These roles have been portrayed at the right side of Fig. 3.

The strategic innovations and the new roles identified were used as instruments to enable an organized reflection on decisions water supply companies might be confronted with in the near future. For

[4] In the Netherlands, provinces and municipalities – the shareholders – hold water supply companies accountable for their financial results.

example, if advising and actually providing water-related forms of wellness, should water companies strive to connect these services with consumer concerns for sustainable development in an explicit way? Or more general, how can sustainable water consumption be established without giving in on the articulated consumer demands for convenience, comfort and luxury? What priority should be assigned to 'ecological' consumer concerns if compared with other (projected) consumer concerns like their wish to 'outsource' a number of water-related household chores? When considering future roles related to the field of sustainable development, water supply companies are confronted with a number of options. They can decide to focus on ecological modernization of their own upstream production processes (CSR company), engage in sustainability activities pertaining to the domain of other providers (providing hot water; providing sustainable wellness) or actively engage in environment- and climate-related information flows (e.g., water could become part of the environmental label for houses if this label incorporates information on the average use figures to be expected in case of a specified number of inhabitants with 'average' behaviour).

When developing a more pro-active role in the field of sustainable development, what kind of contact-relation do water companies envisage with the end users of the innovations? Should they start working with a segmentation of their target-group? Should they invest more time and money in actively developing and maintaining a relationship with their customer–consumers? And how should innovations be provided (e.g., public vs. private mode of provision), how should the new roles for the water supply companies be institutionally embedded and marketed? Some of the innovations and new roles can be marketed in a direct way, whereas other roles do not fit easily in the present strategies and constellations. Some activities and roles need experimentation and research before a working link with domestic end users can be established in a meaningful way. To shed light on these issues, the perception of consumers with respect to future activities of water supply companies was made subject of a next consumer focus group discussion.

7.2. Perspective of the end users of water

The follow-up focus group discussion with consumers held in March 2009 aimed to assess the innovations as they were envisaged by water providers from a consumer perspective. Consumers showed a favourable stance towards CSR strategies of water supply companies and more generally towards innovations framed along sustainability storylines. According to consumers, CSR strategies should include efforts to make water extraction and production processes more sustainable. They pointed out that efforts to educate citizens and to contribute to the realization of the UN Millennium Development Goals should form part and parcel of these strategies.

Environmental innovations – for example, more sustainable water management around the home – were evaluated more positively than activities that were perceived as luxury (in the latter category consumers also included 'sustainable wellness'). Especially when discussing downstream and core-business innovations, consumers were not clear about the question whether innovations of this kind should be offered as an optional service (e.g., leakage notification) or as something to become obligatory for all end users. Pre-paid water was discussed as an example of a downstream core related innovation that could result in disempowering especially of low income end users vis-à-vis the water providers. This is probably related to end users' tendency to view their water company as a natural monopolist rather than as a provider of optional services. Against the background of this general image, new metering concepts were perceived as forms of surveillance of consumers. It seemed that, contrary to the energy sector, the notion that citizen–consumers, given an array of new choices, can be empowered with regard to water services is relatively new.

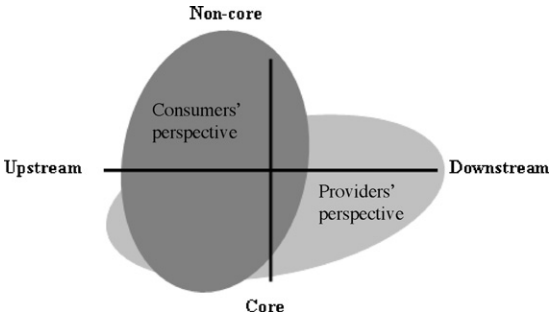

Fig. 4. Potential for innovation from a providers' and from a consumers' perspective.

Looking at 'upstream' and 'non-core' innovations, consumers were quick to accept some new roles for the water supply company if innovations were judged to be desirable. Although being a bit reluctant to accept the need for non-core innovations in the first place, consumers generally expected the water company to play a role in most of the upstream water activities as offered for discussion. Within the downstream and non-core innovations, participants would prefer their water company to provide products rather than to act as a certifier or consultant for new products and services, which may be at odds with consumers' preference for non commercial activities.

In summary, the participants of the consumer focus group associated their water supply company with innovations and roles that are closest to the traditional image of water companies as actors deploying 'upstream/core' activities (public utility, company employing a CSR strategy with an active consumer orientation). The 'downstream/core' roles and innovations ranked second (provider of services). When reflecting on non-core activities from a consumers perspective, the participants tended to evaluate upstream innovation closely connected to the water flow as being more logic and realistic than downstream innovation. The latter kind of innovations is easily associated with 'commercial activities', which do not seem to fit the consumers' image of their water supply company.

So with respect to future activities and roles, consumers do assign their water providers with tasks and responsibilities in the field of sustainable development. Water companies are expected to serve consumers with sustainable products and ideas, without becoming a private, commercial provider. The negative evaluations of consumers regarding potential commercial services by water providers do probably originate from their equally negative sentiments concerning the privatization of other utilities.

Combining the results of the provider and consumer focus groups it can be concluded that providers and consumers tend to evaluate the chances for innovation in the water sector slightly different, using also different perspectives on water provision. Fig. 4 highlights the different perspectives of consumers and providers on the innovative potential for drinking water companies.

8. Conclusions

Our main research questions referred to the emergence of new products and relationships in the water sector. With a special eye on eco-innovation we wondered how and to what extent consumers are becoming key factors to be considered by providers. To be able to analyse the evolving orientation on consumers and their sustainability concerns, we developed a conceptual tool distinguishing between upstream vs. downstream and core vs. non-core processes and innovations. We argued that processes at the downstream end of the water chain should be conceived in terms of social practices of water consumption. Thinking in terms

of consumer practices like bathing, washing and toilet use gives water providers the tools to truly evaluate water innovations from a consumers' perspective. With the help of desk research and a series of focus groups with water providers and consumers, we tried to empirically substantiate our conceptual frame and the consumer orientation implied in it.

From our analysis we first of all concluded that providers tend to subscribe to the idea that a general shift from supply-side thinking towards more consumer-inclusive innovation strategies can be observed in the Dutch water supply sector. Water supply companies are investigating in and experimenting with new roles to complement their classical role of being an upstream operating (public) provider of water. The desk research and the provider focus groups showed that water managers are now considering several innovation routes also at the downstream end of the water chain and started to think beyond the core business of piped drinking-water supply. The new roles identified in our research vary from being 'supplier of other than merely plain water flows', 'consultant/advisor', 'certifier', 'provider of services', 'provider of products', to a role as 'CSR company with an active consumer orientation'. These different roles can be said to represent different degrees of orientation on consumers' water practices, different forms of envisaged inter-provider competition and different levels of environmental ambition.

Although in theory subscribing to out-of-the-box thinking, consumer-inclusive strategies and a future of dynamic and diversified service provision, water providers during the focus groups showed rather strong reservations with respect to the present conditions they are confronted with when trying to translate these ideas into concrete provision strategies. With the present constraints on inter-provider competition and the reservations with respect to the liberalization of water markets from the side of the Dutch government, water companies in the end ranked innovations in a rather predictable, classic way: core-innovations are preferred over non-core innovations, and upstream activities (with a pro-active consumer orientation) are preferred over downstream activities involving new relationships with consumers and competitors. Given the existing regulation and policies in the water sector, water supply companies do not think of themselves as key players with strong powers to start new strategic activities.

From a consumer perspective things are less complicated. Participants in the focus groups indicated that in principle all the suggested new activities related to water delivery and water quality logically fit the present and future profile of the water supply industry. Some activities deemed even less obvious by water providers, like for example the active servicing and management of the water systems of households or the delivering of hot water, are in principle welcomed by consumers. Consumers seemed to be less concerned with issues of core or non-core business and would not mind water providers to become more active at the downstream end of the water chain. And, although agreeing with providers on the idea that water so far has been a low involvement and low-cost product, consumers clearly demand their water providers to be 'solid and sustainable'. Water supply companies are strongly associated with efforts for the environment, high water quality and public health. Much less obvious for consumers was the potential commitment of their providers with 'luxury' and wellness. In conclusion, the focus group participants envisaged new services and new roles for the water industry, as long as they are based on and are in line with the classical view of water companies as public organizations that act responsibly and do not engage in risky commercial services.

These observations show that consumer perspectives do not automatically coincide with the perspective of providers, making it useful for water companies to systematically analyse consumer perspectives. Consumers look primarily at innovations in terms of functions and products, and do not seem to care too much about the (re)positioning of water companies as key players in the systems of provision behind their bathing, washing and toilet-use practices. They have no stake in inter-provider competition; they evaluate water innovations from another point of view and are even using a different language when reflecting on innovations. Against this background we conclude that the inclusion of a consumer's perspective in the early stages of the innovation process would offer water supply companies valuable information. Connecting to consumers more frequently and in a more direct way can be instrumental for making water innovations into a success, or can at least help to prevent foreseeable failures due to misfits that emerge with the perceptions and practices of consumers. We hope that the framework developed in this article invites scholars and practitioners to apply consumer-inclusive analyses to other (geographical) contexts with different water situations and institutional backgrounds.

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