



The technical is political

Understanding the political implications of sector characteristics for the delivery of drinking water services

Nathaniel Mason, Daniel Harris and Richard Batley

Key messages

- The water supply sector has characteristics that have political as well as technical implications. They affect the ways individuals and groups interact in relation to the delivery of drinking water services.
- These characteristics vary in important ways across urban, peri-urban and rural contexts, and across networked and non-networked delivery mechanisms, with implications for the types of political dynamics that might lead to sustainable improvements in sector outcomes. Even where private sector provision dominates, political factors complement market forces and technical needs in determining outcomes.
- Using a structured approach to understanding the relationship between technical and political features can help make sense of key sector debates, bridge the linguistic and conceptual gap with the models of governance specialists and strengthen understanding of why performance in water supply services might either outpace or lag behind other sectors in a given context.

1 Introduction

This brief, the second in a series, aims to help bridge the gap between governance and sector specialists by examining the politics and governance of water supply through a technical, ‘sector characteristics’ lens. The characteristics of sectors have largely been considered technicalities, but new research is illustrating that they also have political implications. Mcloughlin with Batley (2012) identifies an initial set of four types of technical characteristic that influence the politics of service delivery within and across sectors:

- *Nature of the good being produced:* Can the market deliver the service, or does it require public intervention?
- *Market failure characteristics:* What is the rationale for public intervention?
- *Task-related characteristics:* How does the way a service is produced and delivered affect relationships of control and accountability?
- *Demand characteristics:* How does the nature of the service provided affect the form of user demand and provider control?

These characteristics may have a wide range of political implications, affecting the incentives, accountability and power of politicians, managers, professionals and users of services. Drawing on the findings from a series of consultations with water supply specialists¹ and recent illustrative literature, we explore below how such an approach could help us understand and interpret some of the persistent problems undermining the achievement of universal access to safe water.²

This brief focuses on drinking water supply, often perceived as a subsector within the broader water sector, the latter of which comprises water resource management functions, irrigation and other services, notably sanitation (the subject of another brief in the series) and hygiene. Within water supply, there are important distinctions to be made between rural and urban services, as well as the spaces in between – such as peri-urban areas and small towns. The technical, and political, characteristics vary substantially between these, thanks to the different configurations of actors and technologies involved. These range from boreholes drilled in rural areas to serve small villages, with management entrusted primarily to user groups; to large networked supplies run by a utility that serves many thousands of urban customers. However, for the majority of low-income households in developing countries, water supply conforms to no archetype, but rather depends on multiple alternative sources. In keeping with feedback from the consultations, the need to differentiate within the water supply sector (or subsector) is explored wherever possible.

¹ Consultations were held at the offices of the Overseas Development Institute (ODI) in London in August 2013. Participants were drawn from a variety of backgrounds, including non-governmental organisations (NGOs), consulting organisations and professional and training institutes.

² Deliberations on the shape of water supply in the post-2015 development agenda have highlighted the major preoccupations for the sector, including (i) extending access; (ii) progressively enhancing sustainability; and (iii) tackling inequalities (see, e.g., JMP, 2013). These themes are returned to throughout the remainder of the paper.

2 Technical characteristics and the political challenges of inclusive delivery

2.1 Reliance on infrastructure shapes rather than eliminates the political nature of water service delivery

Water supply can be seen as an infrastructure sector as well as a social sector like health or education. All services rely on some degree of ‘hardware’ for their delivery. But, while health and education services are normally provided within certain infrastructure installations (e.g. schools or clinics), they are not necessarily tied to these. In water supply, users are often connected physically to providers via an installation, whether a tap, standpipe or handpump.

The importance of infrastructure entails certain technical characteristics and certain political implications, some of which are well known in the water sector. For example, the way the **visibility** of certain tasks affects both the incentives of relevant actors and power relations among them often affects the politics of water service provision. The development of new infrastructure is often attractive for actors, from international donors and NGOs to national and local politicians and utilities. Ground-breaking and ribbon-cutting ceremonies provide opportunities to seek credit from funders, voters and service users. This helps explain the tendency to prioritise new infrastructure, often to the detriment of much-needed investment in less visible aspects of delivery, such as water quality and maintaining existing services.

Other implications of the centrality of infrastructure may be more counterintuitive. On a simple reading, **transaction intensity** might be assumed to be low: once the hardware is installed, services can be provided with minimal interaction between user and provider. It might also be assumed that front-line staff have limited **discretion** about how they perform service provision tasks, given the low levels of **variability** inherent in water supply: in theory, a well-functioning water service provider is expected to offer a highly standardised service – potable water meeting defined thresholds for supply quality and continuity.

On this reading, the challenges of water supply might be assumed to be predominantly technical: ensuring availability of competencies and resources to install and maintain infrastructure to a required standard. However, the infrastructural components cannot be seen in isolation from the institutional aspects. Closer inspection puts the above conclusions on these technical characteristics, and their political implications, under strain.

Assumptions of low transaction intensity are certainly less tenable for non-networked forms of supply, particularly where there are many intermediary service providers, as is often the case in peri-urban areas. Here, rather than a single utility, a wide range of small-scale providers, often private, meet households’ water needs through diverse means. For most

water that is not received from an unsupervised pipe in the home or a public area, there will be some interaction (or transaction) with a service provider of some sort.

These intermediaries are highly diverse in their scale, complexity and business models. Generalisations are thus risky, but what these providers arguably have in common is they are usually dealing with smaller economies of scale than are large-scale ‘official’ providers. Consequently, there is potentially scope both for greater customisation of the service provided and for users to directly engage with the (intermediary) provider where services fall short of expectations. The structural challenges small-scale providers face, including limited economies of scale, lack of capital and legislative barriers, may nonetheless prevent this ‘closer’ relationship with customers from yielding improved services.

With networked supplies, low transaction intensity may predominate but may not be desirable. Frequent interaction with existing and potential customers is central to sound utility performance – from billing and revenue collection to assisting low-income consumers with getting connected (WSUP, 2012). In rural water supply, limited emphasis on transactions after a facility is installed can contribute to a sustainability crisis. The need to establish local institutions for maintenance is well recognised (Cairncross et al., 2010); what is becoming clearer is the extent of support – or intensity of transactions – between provider and community this requires (whether directly or mediated by private sector organisations). Given the importance of **co-production** in water supply service delivery (Ostrom, 1996), arguments for increasing transaction intensity may be unsurprising, but this forms an interesting contrast with other services, where efforts to reduce opportunities for corruption involve reducing transaction intensity (e.g. automation of customs procedures).

Discretion may also be higher than the account above suggests. Again, this may be most evident in non-networked systems, as when tanker truck operators control the level of access groups/individuals have to drinking water. Yet even operators of networked services can vary service quality – for example by altering supply pressure or duration – for different parts of the network. As one consultation participant observed, poorer areas are more likely to be interrupted first, as wealthy consumers often have greater political voice. In the absence of effective regulation, such discretion offers ample opportunity for front-line staff to facilitate illegal connections and falsify meter readings to generate kickbacks (Box 1) and take advantage of the **targetable** nature of water services to reward political clients.

The forms of variability and the opportunities for discretion they afford are arguably not the same as in health or education. In the latter sectors, staff can provide a diversity of conditions, diagnoses and treatments (health) and levels of knowledge, learning activities and subjects (education). In water supply, where all users ultimately seek the same thing – sufficient clean water – it is easier for them to compare experiences and judge quality. Further, while variations may exist in some aspects of provision, often to the detriment of poorer areas, in many cases they are experienced collectively rather than individually, potentially offering greater scope for collective action on the part of affected users.

Box 1 Front-line staff discretion in Colombo’s water services

In Colombo, Sri Lanka, meter readers taking kickbacks to under-charge households is a major hindrance to the financial sustainability of the National Water Supply and Drainage Board. In response, the Board has tried devolving responsibility for connection fees and tariffs (as well as some operations and maintenance functions) to community-based organisations. Not all community members trust these new intermediaries, but additional safeguards have been put in place, including random checks on meter readings, computerised tracking and incentives for meter readers to counteract the root problems of low pay and motivation.

Source: Mcloughlin and Harris, 2013

2.2 Water sector professionals constitute a diverse set of political actors

A corollary of the infrastructural nature of the water supply sector is that the predominant professional cadre is engineers. Yet it would be a mistake to assume that the technical knowledge that helps define these actors renders them apolitical.

As in education (teachers) and especially health (doctors), water sector engineers have a language, skillset and credentials that can provide a degree of professional autonomy and power. Indeed, McLoughlin with Batley (2012) suggests a combination of characteristics, including transaction intensity, variability and discretion often implies potential for professional dominance, whereby the technical cadre gains political importance through its influence over managers, users and policymakers with regard to key features of service delivery, including investment priorities, organisation of supply and standards of service.

Elements of professional dominance may exist where professionals or providers collude to exclude competitors, manipulate prices or oppose reform – among smaller private providers as well as major utilities. Anecdotal evidence from Tanzania, however, suggests this form of rent seeking becomes more feasible as private water-vending businesses get larger. Larger vendors can better establish **monopoly** power, reducing opportunities for service users to opt out to alternative providers (Box 2), and also possess greater leverage to make special arrangements with corrupt agents within the official provider.

Box 2 Tendency towards monopoly in the urban water sector

The size of capital investments and potential economies of scale in larger networked systems provide a technical case for fewer providers on efficiency grounds, indicating a tendency towards monopoly. The political implications of this include the weakening of users' direct accountability relationship with the provider, necessitating a stronger public regulatory role. In Chile, the natural monopoly afforded to providers has led to the placing of a limit equivalent to a 9% return on assets on profits. However, consultation participants noted monopolies do not inevitably emerge, even where networked systems exist: the developed world perspective that sees single utilities as the dominant model is questionable in a number of developing country contexts, especially in peri-urban and informal settlements.

Source: Manghee and Poole, 2012; consultation participants

However, looking at the diversity of actors involved in most developing country contexts, it is difficult to discern a single block of unionised public servants or organised entrepreneurs, able to create powerful political constituencies. Levels of expertise and autonomy vary substantially across the sector and contexts. In many of the diverse delivery models described above, front-line providers engaged in transaction-intensive exchanges with users may be those with the lowest levels of professional organisation. Thus, in many contexts, professional autonomy exists for some but tends to be incomplete, both for the professional cadre and for utility managers (often themselves engineers by training) who maintain relationships with political elites who may want to direct service delivery for political gain.

A number of countries have tried commercialising/privatising providers in order to increase autonomy, through changes in organisational arrangements for service delivery. In practice, however, there are no guarantees that technocrats and professional managers can be insulated from political dynamics. Manghee and Poole (2012) describe a variety of governance arrangements with varying levels of *de jure* autonomy, but in all the cases providers and professionals remained embedded in deeply political relationships throughout processes of reform, particularly where financial autonomy was limited.

Subsidising water supply infrastructure, and its maintenance, is common in both rural and urban areas. However, providers in developing countries may have difficulty maintaining subsidies, often lacking the capital reserves or the capacity to obtain credit. They may also be unable to develop and implement financial sustainability strategies that pass costs on to consumers in an affordable manner. They thus often come to depend on financial bailouts by political actors, compromising their autonomy. This can give leverage to actors within government seeking to manipulate the distribution of water supply to political advantage, or at the very least reduce the operational autonomy of service providers.

Once a network is built, subsidies may also be needed to help households connect. Here there is at least some convergence between economic and social arguments, but political incentives can thwart these. Subsidising connections is likely to offer a better way of targeting poor households than subsidising tariffs for consumption, which benefit only those already on the network. But poor targeting of consumption subsidies may actually create a political barrier to their reform: block tariffs that allow many consumers to benefit, irrespective of income level, often enjoy broad popular support (Komives et al., 2005).

2.3 Users' demands may appear cohesive, but can entail both competition and collaboration

Demand for drinking water might be expected to be relatively homogenous across users. In essence, everyone wants a safe and consistent supply. This may imply users have inherent common ground around which to mobilise, cooperate and demand improvements from providers and government. But a deeper look at technical characteristics reveals subtleties.

Demand for water is likely to be relatively **predictable**, and of relatively high **frequency**, albeit with certain fluctuations that providers need to anticipate. These extend beyond a simple wet–dry season typology, to encompass a wide range of different seasonal variants, like labour expenditure on agricultural tasks in rural areas. In Ethiopia the coincidence of peak labour times with the dry season constrains poorer households' access to water, whether from nearby springs where queues are long or from more distant ones where travelling time is greater (Coulter and Calow, 2011). Service providers may thus need to nuance their expectations of the predictability of demand across time and user groups, as well as the capacity to make regular time-specified payments, if equity is to be guaranteed.

However, analysing the political implications of these characteristics suggests predictability and frequency are not relevant only for technical aspects of water resource management but also for understanding consumer behaviour and the potential for political mobilisation. Where demand is predictable and frequent (even if variable), there is likely to be greater scope for interest groups to coalesce around service issues, particularly where there is a shared provider. Seasonal variability may complicate this, but may also offer opportunities for well-timed initiatives that capitalise on user awareness of impending service shortfalls to facilitate political mobilisation, altering the relationship among users and between users, providers and politicians.

The **territoriality** of demand for water is another important consideration.³ The spatial boundaries defining which users choose which source might be assumed to be well delineated: the labour and drudgery involved in collecting water will encourage households to choose the nearest available source. With networked services, the network itself *in theory* defines the boundary. Where the territory in which a service is consumed is clearly defined, users might be expected to identify with one another and be better positioned to collectively hold providers to account. Users from a certain area being connected through the same networked infrastructure, or converging regularly on a single point source, might be expected to increase the potential for interactions and mobilisation around shared problems, thus contributing to the success of community management programmes.

³ People may have to travel to seek a water source – thus the territoriality of demand can also change seasonally.

But again, nuance is necessary. In networked areas, while the provider has an understanding of the reach of the network, where household connections are the norm services may nevertheless be experienced in a highly individualised manner. For example, disruptions may affect multiple households, but complaint systems can see users engaging with providers on a one-to-one basis. This particular set of organisational arrangements alters the relationship and balance of power between user and provider. Further, the boundary the spatial extent of pipes creates is often blurred. Kiosks, standpipes and neighbours reselling water are in effect point sources in the network, each with their own ‘catchment area’ that may extend beyond the official boundary.

The complex overlay of different sources in a given urban or peri-urban territory means disparities in the level of access from one area to another, or from one household to another – a potential source of grievance. Households may tap the network illegally, putting them in potential conflict with the official service provider, the state and other users, who suffer from resultant reductions in quality. Small-scale private providers operating in the network area can end up in conflict with both the official provider and any regulating party, and thus obstruct efforts to increase access to more affordable, higher-quality services. A more pragmatic approach to small-scale private providers, incorporating and regulating them as a part of the overall water supply service strategy, may be preferable (van Dijk, 2007).

Competition and dispute between users is more likely where services are inadequate. Communities in Ghana, India and Tanzania, all cited reduced tension/ conflict when asked about the benefits of reliable water supply in their communities (Adugna *et al.* 2001). This may be a facet of another technical characteristic, **rivalry**, should the presence of additional users imply a real or perceived reduction in availability. In practice, it may not be water itself that is the rivalrous good, but ease of access to it: where water reserves at a waterpoint are high but flow is low, each additional user can significantly increase overall collection time.⁴ In either case, institutional arrangements that effectively facilitate collective action, whether self-organised within a community or involving a provider or a regulator, will be necessary to avoid the potentially divisive implications of rivalry.

2.4 A stake in water services doesn’t necessarily translate into ability, or willingness, to engage

An important consideration is whose demands and needs for water count. Improvements benefit women significantly, primarily because of the greater role they tend to play in collecting water in many countries (JMP, 2010). But while the positive **externalities**, such as time savings and health benefits, disproportionately affect women, they are rarely involved in decisions about how to site and manage water supplies. This is, in essence, a market failure: gender-related externalities are not captured and factored into the costs and benefits of water supply decisions. In a community context, this may be attributed to customary patriarchy. Women may also be disadvantaged by economic appraisals that fail to capture informal economic activities, in which women can more readily participate if their time is freed up from water collection (DFID, 2013). Meanwhile, in Nigeria, while women may be motivated to collectively demand improvements to water supplies, there are a number of potential barriers (Box 3). These include the form and extent of existing social institutions, and the gender dynamics within these; and the availability of alternative options that can make switching providers a simpler option than protest.

At the same time, where women perform the majority of water collection tasks within the households, other users can be insulated from service inadequacies, or not attribute these at first hand to the service provider. In other words, the ‘user’ at the interface with the provider is often not the end user. Brief 1 in this series, on education, raised a similar issue: children

⁴ Further evidence is needed on when users perceive other users as rivals or not, but it is likely that this depends on a variety of factors that extend beyond the characteristics of the sector, potentially including levels of social cohesion, credibility of political commitments, past experience with service use and patterns of improvement.

are often the end users of education services but rely on parents to act on their behalf with respect to ensuring access and quality. In this case, the relationship is slightly different, as the person on whom the household is reliant is also a user. While this mitigates some of the motivational problems that can occur in teacher-parent-pupil relationships, engrained social norms may prevent women from advocating individually or collectively for improved services, while other (adult, male) end-users are insufficiently aware of the problem.

Box 3 Gender and mobilisation over water supply in Nigeria

Research in Benin City and Lagos investigating how women and men respond to inadequate water services found that protest was used more than twice as often by women who belong to religious associations, implying that collective action around services is more likely for those individuals with some experience of institutions that foster social cooperation. Protest, as compared to exit (changing provider) or loyalty, was *less* common for members of neighbourhood associations. The research associated this with the tendency for men to dominate such associations, in terms of both leadership and general membership. Other issues included deep scepticism about the likelihood that the official service provider would respond to any complaint. Furthermore, the profusion of alternative sources and providers of water, even if also unsatisfactory, meant exit was often perceived as a viable option.

Source: Acey, 2010

2.5 The contested status of water supply as a good can lead to uneasy relations between users, providers and government

Water can be classified as a public, private or merit good. In economics, and in political economy, **rivalry** and **excludability** are used to determine whether a good is public or private. Public goods are those for which the rationale for a public role in service delivery is clear, as it is practically impossible to exclude one additional consumer without excluding all consumers, and the marginal cost of providing for an additional consumer is zero, once the good has been produced. When provided through piped networks, water supply is generally considered a private good.⁵ Free tapstands and point sources that can be accessed by anyone unless they are fenced or protected by force are public goods. Regulation to ensure water supply quantity, price or quality can also be characterised as a public good.

However, the public–private good distinction, framed in an economics perspective, has an uneasy relationship with the extensive rights-based discourse prevalent in the sector, which argues the public sector has a duty to ensure all rights-holders can access safe, acceptable, affordable water, sufficient for personal and domestic uses (Albuquerque and Roaf 2012). In theory, this is compatible with the definition of regulatory functions as a public good – as long as those functions, undertaken by the rights-bearer (nominally the state), extend to ensuring that tariffs and other charges remain affordable for all. In practice, however, many people, including many poor people, are excluded from the official water supply in the first place, meaning that whether or not tariffs are regulated makes little practical difference to them. An additional, and emotive, layer of complexity may be engrained sociocultural norms that view any attempt to charge for water as anathema (Harris et al., 2012).

In the face of this impasse, public subsidies are likely to be needed for water supply, especially for capital development. This accords with the perception of water supply as a **merit good**, at least insofar as merit goods can be defined as those for which the value to society outweighs that to the individual consumer. On this reading, water supply provides significant social value, as it helps prevent the spread of waterborne diseases, and enables greater productivity by citizens. An alternative definition of merit goods is those goods that

⁵ In fact, the marginal cost of each additional consumer is likely to be low rather than zero, and widespread illegal connections in many contexts contradict the idea that the service is fully excludable (e.g. Harris et al., 2012).

tend to be under-consumed because people lack the information to make decisions. This is harder to apply in the case of water supply (as compared with, e.g., sanitation), as there is high recognition among private households of the benefits, and consequently high demand.

The temptation for political interference in water supply and the support that socially and economically inefficient subsidies enjoy are two sides of the same coin: **political salience**. Given its obvious centrality to human survival, water supply arguably has a high degree of political salience. At the same time, delivery arguably offers less scope for shaping social and political norms, as compared with education, for example. The concept of water as a human right does, however, open up space for intense normative debate around social and political responsibility. In South Africa, where citizens can by law claim 6,000 litres of free, safe water per household per month, legislation itself provides the arena for contestation (Albuquerque and Roaf, 2012).

In contexts where the policy and legal framework protecting citizens' rights is less robust, appeals to the human right to water are vehicles for public protest but also political manipulation. One expert we consulted referred to political leaders engaging in populist tactics by discouraging constituents from paying for water, without concern for financial sustainability. The potential tensions between normative and practical considerations around the right to water, and the fact that the concept offers political leverage, make it a challenging area. The South Africa example does, however, suggest that a clear and coherent policy and legal framework can help navigate some of these challenges.

2.6 Assessing quality, sustainability and outcomes is difficult

Water supply appears to be relatively simple to value and price, with high **measurability**. Compared with health and education, there is ultimately only one good being sold, with marginal cost established by volume. But again this oversimplifies. Quantity may be relatively straightforward to measure where water is sold by the volumetric container (from a tanker-full to a sachet). But in networked systems it relies on accurate and widespread metering, which may often not be the case (although World Bank research indicates meter penetration may be higher in Africa than previously thought – Banerjee et al., 2008).

Meanwhile, the quality of water supply is much harder to assess. In this regard, consumers may be disadvantaged compared with providers – an example of **information asymmetry** that points to the need for effective water quality regulation. Consumers may utilise proxies for water quality such as taste, smell and colour. But many biological and chemical contaminants are indiscernible to the user. Arguably, at root here is confusion over the relative simplicity of measuring outputs (availability of water at point of use) and difficulty, as in many sectors, measuring outcomes (improved health through safe drinking water).

This manifests itself in broader terms between service providers and government, or donors. There is renewed attention in the sector as to what represents 'value for money', or 'results', stemming not least from the problems encountered through a general focus on quantitative outputs – such as numbers of boreholes drilled or of households connected to a network. While increasing these outputs is undoubtedly an important first step, they do not by themselves say much about the quality of service or its sustainability over time. As a consultation participant observed in relation to the problem of low-quality borehole installations, the gulf between output and outcomes can manifest as an information asymmetry between the commissioner of the service and those contracted to provide it.

Outcomes are that much harder to measure. They require a different kind of monitoring, which may be more time intensive and prolonged. But efforts to increase focus on and measurement of outcomes may also be resisted for political reasons. The political value of outputs – extending water access to unserved communities, or improving the quantity of water available – can be significantly undermined when attention is drawn to less visible problems of health risks or lack of functionality.

3 Conclusion

An understanding of the political implications of a sector's technical characteristics offers a number of insights into the challenges faced in the pursuit of achieving universal access to safe water. We have highlighted the need to consider how technical characteristics, and attendant political implications, may differ across subsectors: between rural and urban areas; between point source and networked forms of provision; and in particular in areas in between these categories, where many poor people live and a multiplicity of inadequate forms of service may exist. This provides some insights into key debates in the sector – from how to enhance sustainability to the reconciliation of rights-based and economic perspectives on equitable provision. This note has looked beyond conventional interpretations of how water supply services are configured and how actors providing, regulating and using them interact.

We hope this approach offers a language and set of concepts to break down professional silos and bring sector and governance specialists together on issues of mutual interest, to help with complex realities and with capitalising on opportunities to improve service delivery. The novelty of certain technical characteristics for governance specialists, and of some political science concepts for sector specialists, means we have focused for the time being on translating between the two; the practical ramifications of using such a lens will be highly context dependent. Nonetheless, we hope further research in this vein will help tease out key questions and approaches to enhance politically aware programming and policymaking. For example, identifying the transaction intensity, territoriality and monopoly tendency of a form of service offers a structure to think through the interactions and expectations between users and different agents in the delivery chain. From here, it may be possible to counter or moderate the most perverse effects of these characteristics: harnessing customer-facing, transaction-intensive small-scale providers to accelerate extension of high-quality networked services; providing support mechanisms that help users self-identify and mobilise around their 'territory'; checking monopolistic tendencies through appropriate contractual safeguards and, where appropriate, regulatory oversight.

The approach does not, however, provide a comprehensive explanation of the politics of service delivery in any given context. Our understanding of sector politics as a whole requires more information about the broader institutional context within which services are delivered (e.g. the rules of political competition, what cultural norms are active etc.). In broader terms, the value added from this work is its ability to shed light on observed differentiation in a particular context (i.e. why you might see progress in one sector but not another); and to understand the political dynamics that underpin outcomes in a particular sector. We expect there to be useful lessons to be learnt across sectors, not simply by transferring what works but by understanding the dynamics that make an intervention able to address, both technically and politically, key constraints to performance.

Finally, we note that our analysis does not cover all the characteristics identified in the original paper by McLoughlin with Batley, while new ones, such as the propensity for co-production, have emerged from the process of consultation with water supply specialists. This process of development and adaption is inevitable as specialists in different disciplines engage with this material and as these ideas are applied in new contexts. Feedback on the utility of these ideas and how they can be refined will be crucial and is most welcome.

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Overseas Development Institute
203 Blackfriars Road
London SE1 8NJ
Tel +44 (0)20 7922 0300
Fax +44 (0)20 7922 0399



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