

## WUM Model: Emerging tool for evaluating institutional capacity of urban water utilities

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### Abstract

Urban water utilities in the world's developing regions are faced with challenges of scaling up services to cope with the rapid rate of urbanisation, and sustaining the service delivery. Increasingly, it is being recognised in development management that institutional capacity is a precursor for sustainable service delivery. This paper discusses the findings of a recent study funded by the World Bank, which, using case studies in Asia, examined the various conceptualisations of institutional sustainability, institutional capacity and capacity development, in the context of urban water services. Consistent with a process-based approach, and adapting concepts from organisational maturity models, the authors propose a new evaluation tool – the Water Utility Maturity (WUM) model. The outline WUM model was piloted with utilities in South Asia, and was found to be promising. The WUM model is flexible and considers different levels of institutional sustainability.

**Keywords:** Institutional capacity, institutional capacity development, organisational maturity models, sustainability, urban water utilities.

### Introduction

It will soon be 2015, the year when the United Nations will review achievement of the Millennium Development Goals (MDGs). Based on previous trends, it is anticipated that most countries of the developing region will achieve the MDG target on drinking water, i.e. halving the proportion of the population without sustainable access to safe drinking water. Even so, about 700 million people will not have access to safe drinking water in 2015 (WHO/UNICEF, 2010). During the post-2015 era, urban water utilities in less developed regions of the world will face greater challenges in extending and providing water services, where, it is projected, the urban population will increase from 2.57 billion in 2010, to 3.95 billion in 2030 (UN-Habitat, 2010). Provision of sustainable services will require a higher level of institutional capacity on the part of water utilities.

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Some development literature has interchangeably used the concepts of institutional capacity and institutional sustainability. This paper reports on a study carried out under the auspices of the World Bank, in which we did an extensive review of literature on the definition and evaluation of these concepts, and then developed a conceptual framework which can be used to measure the institutional capacity of an urban water utility. The next section briefly describes the methods used for the study. The third section reports on how the key concepts of institutions, institutional sustainability and institutional capacity have been defined in the international development literature. The fourth section briefly reviews the concept of organisational maturity. The fifth section synthesizes these ideas, and develops an outline for Water Utility Maturity (WUM) model, which is a more effective assessment tool for tracking a water utility's progress towards institutional sustainability.

### **Material and Methods**

First, a literature review was conducted to examine how the concepts of institutions, institutional sustainability, institutional capacity (IC) and capacity development have been defined in international development literature, from which an emerging conceptual framework was identified for defining institutional sustainability. Next, we reviewed the concept of organisational maturity, which originated from the software industry in the early 1990s, and is now commonly applied in other industries. Then, we synthesized these concepts to develop the outline WUM model. Lastly, we field-tested the WUM model with two major urban water utilities in South East Asia, ensuring that we adhered to research ethics as prescribed by the US National Research Council.

### **Institutions, Institutional Sustainability and Institutional Capacity**

For the past couple of decades, there have been lively discussions on how to conceptualise and operationalize sustainable development, sparked off in 1987 by the work of the World Commission on Environment and Development (WCED) chaired by Mrs Gro Harlem Brundtland. The Brundtland Commission described sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs (WCED, 1987). Much of the academic discussions have centred on the meaning of sustainability and development. However, the definition and conceptualisation of institutional sustainability has not attracted a similar level of debate, even though the Brundtland Commission emphasised the importance of institutions in the achievement of sustainable development (Pfahl, 2005).

Brinkerhoff and Goldsmith (1992) argue that there can be no sustainable development in any sector without the support of effective institutions, hence underpinning the importance of understanding institutional sustainability in development. The next subsections review how the terms 'institutions', 'institutional capacity' and 'institutional capacity development' have been defined and applied in the literature: unpacking the meanings of these key words is useful for internalising the concept of institutional sustainability.

#### *What are institutions?*

It is difficult to provide a precise definition of 'institutions' - the concept has been applied differently in various disciplines and theoretical traditions. Literature is

abounding with different but sometimes overlapping definitions and conceptualisations of 'institutions', shaped by various philosophical and epistemological perspectives such as those held by economists, sociologists and political scientists. Using the analogy of a game, Aoki (2000) demonstrated how 'institutions' have been variously conceptualised, ranging from (i) players of the game; (ii) the rules of the game; or (iii) the outcome of the game. The third analogy, i.e. the 'outcome of a game' perspective on institutions is less common, and is mainly advanced by welfare economists, who argue that social institutions are '...determined endogenously as an equilibrium outcome from which agents are not motivated to depart, as long as others do not modify their behaviour' (Pagan, 2009, p.21-22).

Some literature sources apply the term 'institutions' to mean political or social organisations that are involved in policy-making and implementation. Organisations are groups of individuals bound by some common purpose to achieve set objectives (North, 1990). They are entities with legal personality and staff that act to enforce the rules and implement the entities' goals (Pfahl, 2005). However, most scholars conceptualise institutions to be much broader than organisations. The institutional framework influences what organisations come into existence and how they evolve over time. In turn, organisations influence how the institutional framework evolves (North, 1990).

One of the most commonly cited definitions of institutions is by North (1990) who described them as '...the rules of the game in society or, more formally, are the humanly devised constraints that shape human interaction' (North, 1990, p.3). Institutions could be formal, such as rules that human beings devise, or informal, such as conventions and codes of behaviour. They could be created, such as national constitutions, or they may evolve over time, such as a common law. Other institutional economists like Neale (1994) and Pagan (2009) have adopted this conceptualisation and consider institutions to include laws, customs, social conventions, regulations and rules that structure society's behaviour.

Other scholars cover both dimensions (i.e. the role players and the rules) into their definitions of institutions. For instance, Huntington (1968) defined institutions as stable, valued, recurrent patterns of behaviour, and made a distinction between rule-oriented and role-oriented institutions. Based on this concept, Brinkerhoff and Goldsmith (1992, p.371) defined institutions as '...rules or procedures that shape how people act, and roles or organisations that have attained special status or legitimacy'. The level to which rules or roles are deeply rooted and highly esteemed by a large constituency is a measure of institutionalisation, a process through which organisations and roles acquire value and stability (Brinkerhoff and Goldsmith, 1992; Huntington, 1968). Pfahl (2005) noted that institutions build the framework for human actions in different context, and are patterns of behaviour that implicitly assume a regulatory role.

Application and relevance to urban utilities can best be captured by an all-inclusive conceptualisation by Spangenberg et al (2002), which defined institutions as the rules by which decision-making and implementation is structured; and the rules could refer to social entities as actors, or systems of rules shaping behaviour. The social rules can be subdivided into three categories: (i) organisations as institutions (i.e. actors); (ii)

institutional mechanisms; and (iii) institutional orientations (ibid). Organisations are described as the most tangible class of institutions, and defined as follows:

Institutions are organisations which structure the choice of action of individual or corporate and other collective actors within a society. This includes organisations, which influence all actors or groups of actors in a society, if they directly or through these actors have a significant impact on society as a whole. Organisations can also be described as systems of rules.

(Spangenberg et al, 2002, p.71)

Institutions could also be defined as mechanisms (i.e. explicit or formal systems of rules), or orientations (i.e. implicit or informal systems of rules) that structure the choices of actions of individual or collective actors in a society. It is important to note that organisations, mechanisms and orientations can all be described as systems of explicit or implicit rules (ibid). Along the conceptualisations by Spangenberg et al, (2002) and Brinkerhoff and Goldsmith (1992), this paper adopts the all-inclusive conceptualisation which defines institutions as rules by which decision-making and implementation is structured, i.e. institutions as a combination of organisations (as actors), institutional mechanisms and institutional orientations.

#### *What is institutional sustainability?*

Sustainability as defined in Agenda 21, an action plan drawn by the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, (Brazil) in 1992, is explicit about the ecological/environmental, social and economic dimensions, but is unclear about the institutional dimensions (Pfahl, 2005; Spangenberg et al, 2002;). Yet the institutional setting in which development policies are conceived, funded, implemented and managed is a critical dimension of sustainable development (Brinkerhoff and Goldsmith, 1990; Brown, 1998). It is no wonder Brinkerhoff and Goldsmith (1992) contends that the term 'sustainable institutions' is redundant, given that institutions are, by definition, sustained ways that people interact. In the development circles, institutional sustainability is defined in various ways, as presented in the proceeding paragraphs.

One of the earliest studies focusing on integrated rural development defines institutional sustainability as continuation of the benefit flows to the users/clients with or without the programmes or organisations that stimulated them in the first place (Honadle and Van Sant, 1985). This conceptualisation, which is consistent with the project cycle model of development, is adopted by many international donor agencies, such as USAID, which defines sustainability as the ability of a project to deliver services or sustain benefits after the investment phase (LaFond, 1995). The project approach to planning and development, which usually looks to recipient institutions are implementing partners, is inherently logically inconsistent to institutional sustainability, since there can be no question of continued benefits after the project ends (Brown, 1998). Furthermore, it is difficult to evaluate sustainability of the project, usually done during the implementation phase, by using the indicator measuring continued flow of benefits (ibid).

Another school of thought defines institutional sustainability in terms of the longevity of the institution. The longer an organisation survives as an identifiable unit, the more institutionally sustainable it is considered to be (Brinkerhoff and Goldsmith, 1992). However, there are several flaws and inconsistencies with this conceptualisation

(Brown, 1998): e.g. (i) how long does an organisation have to survive in order to qualify as sustainable? (ii) Is survival of an organisation by itself enough, or there should be some minimum performance criteria for an institution to be considered sustainable? (iii) Some organisations are set up to achieve a specific purpose, and longevity of such organisations may not be necessary or desirable; and (iv) it may be difficult to evaluate the sustainability of the institution ex-ante, during the implementation phase.

In the context of development management, institutional sustainability has also been defined as the ability of an organisation to meet recurrent costs, after donor funding is exhausted (Brown, 1998). Although previously discussed definitions of institutional sustainability (i.e. continued benefit flows, longevity and survival) are all related to financial self-sufficiency, the two concepts need to be kept separate - the financial self-sufficiency definition may not be applicable to developmental activities that cannot generate enough incomes due to low affordability to pay of the beneficiaries, and require co-financing by government. A good example is provision of water services for a rural population in a low income-country, living in a water-scarce area. It is the responsibility of the national government to provide the water services to its population, regardless of the high capital and recurrent costs.

Many reputable scholars refer to institutional sustainability as the capacity of an institution to generate a minimum level and quality of valued outputs over the long term (Brown, 1998; Brinkerhoff and Goldsmith, 1992; Pfahl, 2005). It is '...the institution's capacity to coordinate human interaction in order to achieve specific sustainability objectives' (Pfahl, 2005, p.84). The Norwegian Development Co-operation (NORAD) defined institutional capacity as the ability of individuals, organisations and broader systems to perform their functions effectively, efficiently and in a sustainable way (Norwegian Agency for Development, 2000). Spangenburg et al (2002) stressed the importance of enhancing the self-reproducing capabilities of all the dimensions of the institution, i.e. the economic sub-system/man-made capital, the social subsystem/human capital environmental sub-system/natural capital, and the institutions/social capital.

Brinkerhoff and Goldsmith (1992) pointed out that the definition of institutional sustainability is analytic, rather than normative, and emphasized the dynamic character of institutional sustainability. This position is supported by Hill (2008), who argued that institutional sustainability is not a static descriptor of some regime, but rather a process characteristic – hence the need to critically examine the institutionalisation process. Brown (1998) reinforces this position, and states that learning is an essential ingredient of institutional capacity. Learning is defined as the capacity of an organisation to accumulate knowledge from its own experiences, and disseminate it to its wide membership, reflecting on it and using it to adapt and cope with changes in the operating environment (ibid). Adapting the concepts by Brown (1998), Brinkerhoff and Goldsmith (1992), Hill (2008), Pfahl, (2005), and Spangenburg et al (2002), this paper conceptualises institutional sustainability as the capacity of an institution to continuously generate a minimum level and quality of valued output, and to prioritise organisational learning for continuous improvement.

*How is institutional capacity conceptualised?*

Since the early 1990s, international development partners have applied the term 'capacity' mainly in reference to 'absorption capacity' of the institutions receiving the development assistance. In this context, capacity emerged out of donor concerns for enhanced aid effectiveness, and referred to '...the ability of organisations to implement and manage projects, to exercise financial and product accountability..., to employ and train staff competent to undertake specific tasks, and to report on their work in ways which are acceptable to their donors' (Kaplan, 1999, p.16). Capacity has been described in the literature both as a process and an outcome; as dynamic and multidimensional. On the lower end of the spectrum, capacity has previously been understood to mean training of staff. Capacity as skills development and individual training is still a dominant perspective amongst some international development agencies and national governments (Baser et al, 2008). On the contrary, some analysts seem to suggest capacity to be 'everything'. As an example, the European Communities (2005, p.6) defined capacity as the '...ability to perform tasks and produce outputs, to define and solve problems, and to make informed choices'.

In the recent past, some international development agencies have adopted a multi-dimensional but more focused definition of capacity. UNDP and Norwegian Development Co-Operation (NORAD) have both defined capacity as the ability of individuals, institutions and broader societal systems to perform their functions effectively, efficiently and in a sustainable manner (NORAD, 2000; UNDP, 2007). This definition recognises that capacity depends not only on the capabilities of the people (i.e. the knowledge, skills and attitudes of the individuals, separately or as a group, and their competence to undertake responsibilities assigned to them) but also on the overall scope of the functions, the resources and tools needed to perform them, and the framework within which they are discharged. Community Development Resource Association (CDRA) of South Africa developed a more internally-focused definition, in which capacity is conceived as '...the ability of an organisation to function as a resilient, strategic and autonomous entity' (Kaplan, 1999, p.17). This definition emphasizes the capacity of an entity to organise, rather than to perform particular tasks, often to the satisfaction of the donors.

CDRA's definition is rooted in the concept that an organisation or institution is an open system comprising of a number of features, which, individually as well as the dynamic and harmony of the relationships between them, make up institutional capacity. Hence, institutional capacity emerges out of interaction of the institution's component parts, and is greater than the sum of abilities of the individual parts (ibid, 1999). Similarly, the conceptual framework for capacity espoused by the United Nations Development Programme (UNDP) has evolved over time, and now defines capacity as the ability of individuals, institutions, and societies to perform functions, solve problems, and set and achieve objectives in a sustainable manner (UNDP, 2007).

In their capacity assessment framework, UNDP defines technical and functional capacities, the two types that are distinct, yet inter-related. Technical capacities are the 'hard skills' that are relevant for particular areas of expertise and practice in specific sectors. Functional capacities are 'cross-cutting' capacities required across various levels, which are not associated with specific sectors, key ones being the capacity to engage stakeholders; and the capacity to assess a situation and define a vision and mandate (UNDP, 2008).

The European Centre for Development Policy Management (ECDPM) extended CDRA's process-based approach to institutional capacity and recently carried out research involving 16 global case studies, to have a deeper understanding of how capacity develops, and the interrelationship between the concepts of capacity, organisational change and performance. ECDPM's conceptual framework recognises the importance of individuals' contributions to the institutional capacity in terms of skills, knowledge and competences, although they may not have an immediate linear, causal relationship with the overall capacity. Organisations are made up of people, and institutional capacity highly depends on complexities generated by interplay between individuals, and with the organisation as a human system (Baser et al, 2008; Kaplan, 1999).

The individual people's contributions are the soft competences, such as crafting relationships, trust and legitimacy, as well as the conventional 'hard' variety, such as technical, logistical and managerial skills. The individual contributions build up into collective (organisational) capabilities. A capability is defined as '...the collective skill or aptitude of an organisation or system to carry out a particular function or process either inside or outside the system' (Baser et al, 2008, p.27). Capabilities are what the organisation or system applies to create the developmental value that members of society want. Through an iterative analysis of the country case studies, the ECDPM identified and clarified the nature of five core capabilities, which together contribute to the overall institutional/organisational capacity. Figure 1 shows the five core capabilities, which are described in the preceding paragraphs.

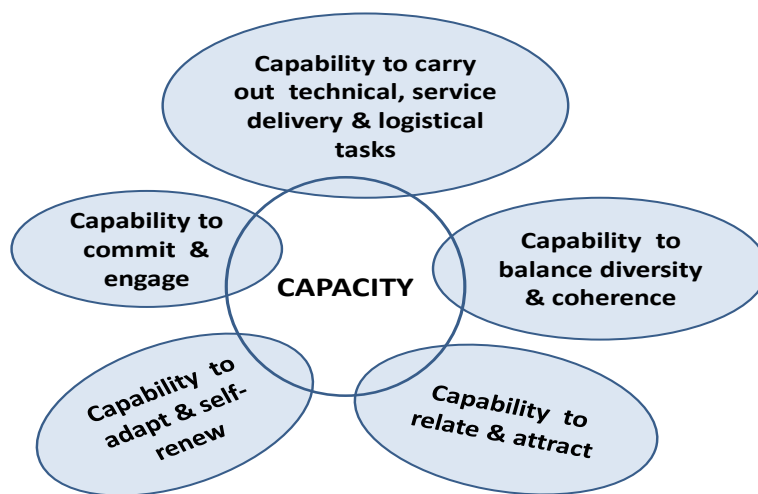


Figure 1: Elements of capacity (source: Baser et al, 2008)

1. The core capability to commit and engage: Considered the most important, this is the capability of the organisation or system to make conscious choices, to empower, create space and autonomy for independent action. This capability is a complex blend of motivation, power, legitimacy, confidence, security, meaning, values and identity and is the ability to motivate unwilling or unresponsive partners to plan, decide and engage collectively to exploit their other capabilities (Baser et al, 2008; Brinkerhoff and Morgan, 2010).

2. The core capability to carry out technical, service delivery and logistical tasks: This core capability includes the abilities to produce acceptable levels of performance; generate substantive outputs and outcomes; sustain production over time; and add value for their customers, clients, beneficiaries etc. (Baser et al, 2008; Brinkerhoff and Morgan, 2010). However, it is important to note that the capability to perform is only part of the complex phenomenon of institutional capacity.

3. The core capability to relate and attract resources and support: This is the capability to relate with other key actors in the external environment and develop/manage beneficial relationships necessary for the survival of the organisation. The organisations need to establish and manage partnerships, alliances and linkages with other actors so as to create operating space so that they can easily influence the acquisition of resources; create legitimacy so that they can more effectively pursue their goals; and deal effectively with competition, politics and power relations (Baser et al, 2008; Brinkerhoff and Morgan, 2010).

4. The core capability to adapt and self-renew: This is the ability of the organisation or system to realise the need to understand and react to global and societal changes by pro-actively anticipating change and new challenges; adapting and modifying plans/operations based on monitoring of progress and outcomes; and developing resilience and coping with changing contexts (Brinkerhoff and Morgan, 2010).

5. The core capability to balance diversity and coherence: This is the ability to manage a diverse set of capabilities, identities, interests and perspectives held by different people in the organisation; and to develop shared short- and long-term strategies and visions. It is the ability to balance control, flexibility and consistency; individual and collective interests; soft and hard skills/competences; innovation with coherence and stabilisation; effectiveness and efficiency; short- and long-term plans; centralisation versus decentralisation; and cope with cycles of stability and change (Baser et al, 2008; Brinkerhoff and Morgan, 2010).

These elements of capacity as based on the conception that an organisation is made up of competent committed people, who together create a human system with collective embedded capabilities needed to create public value. Hence, capacity is further defined as ‘...that emergent combination of individual competences and collective capabilities that enables a human system to create value’ (Baser et al, 2008, p.34). The capacity emerges over time as follows (ibid): (i) as the system grows, it can handle more complex tasks more effectively; (ii) individual skills and competences grow in sophistication and diversity; (iii) core capabilities improve, become more varied, and get more institutionalised; (iv) the tangible and intangible assets and resources of the organisation grow in numbers and diversity; and (v) the collaboration and partnership with key external actors grows, enabling the enhancement of the institutional capacity.

Reinforced by the blueprint ‘inputs-outputs-outcomes-impact’ approach to development, many international development practitioners envisage a causal link between institutional capacity, performance and development results. However, in ECDPM’s conceptual framework, capacity is conceived to be a means in itself, but is also a potential state of performance. ECDPM’s recent study showed that the relationship between capacity, performance and development outcomes is non-linear



and complex, which, to a great extent, depends on elements in the external environment (Baser et al, 2008; Brown et al, 2001; Kimata, 2008). There is a need, therefore, to have a right balance of focus between capacity development and results orientation (Baser et al, 2008).

*How is capacity development conceptualised?*

The conceptualisation of capacity and capacity development has evolved at the same pace. Although the terms ‘capacity development’ and ‘capacity building’ have sometimes been interchangeably used, some scholars prefer the former, which, unlike the latter, is based on the notion that there exist some capacities in every context, and these are used as a basis for further development (UNDP, 2008). At one time, capacity building was defined in relation to increasing the ability of organisations to implement and manage projects (Kaplan, 1999).

Increasingly, international development agencies are emphasizing the long-term, endogenous and integrative aspects of capacity – how capacity develops over the long-term from within, rather than being externally-induced; and how it takes place at different levels. Hence capacity development is progressively being conceived as a process through which individuals, organisations and societies create, adapt, strengthen and maintain the capabilities to set and achieve their own development objectives over time (UNDP, 2008; OECD, 2006; NORAD, 2000).



Figure 2: Levels of capacity development (Adapted from NORAD, 2000; UNDP, 2008)

As shown in Figure 2, capacity development thus consists of, but goes beyond individual and organisational capacity building, and encompasses the wider (system-level) operating environment, including policy, legal and regulatory aspects. The system level provides the enabling environment, which may facilitate or hamper their existence and performance. At the individual level, capacity development refers to skills, experience and knowledge that are imparted to people (including small networks and groups) to become efficient and effective actors in an institution. Some of these capabilities are acquired through formal training, others through experiential learning. At the organisational level, the aim is to develop an organisation with a clear vision, mission and strategy; as well as adaptable systems, structures and tools; and the ability to influence its operating environment in a positive and strategic manner.

The following key lessons may be drawn from the ECDPM's conceptual framework for institutional capacity development:

- Capacity development is a process, not an event;
- Capacity develops through creating, adapting, strengthening and maintaining core capabilities over time;
- Capacity develops from within, rather than being externally induced;
- External interveners can facilitate capacity development, but cannot drive the process;
- Capacity emerges out of interaction of the institutional component parts, and is greater than the sum of abilities of the individual parts;
- Capacity emerges from a complex and difficult-to-chart process of learning and adaptation;
- Much of the focus of capacity development interventions remains on the overt, the formal and the recognisable. Yet many of the factors are hidden and informal; and
- Capacity development is a form of change.

Consistent with the emerging lessons listed above, this study adapted the concept of organisational maturity, in order to come up with a tool for assessing institutional capacity of water utilities. The next section provides an overview of maturity models.

### **Maturity Models**

The use of maturity models has become popular since the early 1990s when the Software Engineering Institute of Carnegie Mellon University developed a Capability Maturity Model to evaluate the maturity of the software processes (Paulk, 1993). Consequently, maturity models have been developed for various organisational capacities, such as project management, supplier relationships, research and development effectiveness, business process management, maintenance management, construction industry, strategic management, risk management and knowledge management (Maier et al, 2009). The organisational maturity assessments focus on practices and processes, rather than individual employees' competences, and, as an organization increases in its maturity, it will implement additional process areas and improve the capability level of each of them (Cook-Davis, 2005).

The maturity model approach to determine organisational capabilities is rooted in the quality management paradigm. For instance, the Capability Maturity Model (CMM) for software development is a framework that describes improvements in the quality management processes and systems for software development. The CMM describes an evolutionary improvement path from an ad hoc, immature process to a mature disciplined process. It covers the practices for planning, engineering and managing software development and maintenance (Kumta and Shah, 2002). The CMM has five maturity levels: each level is a well-defined evolutionary plateau toward achieving a 'more mature' software process, and provides a layer in the foundation for continuous process improvement (Paulk, 1993).

An important strength of maturity models is their ability to monitor the progress in a stepwise and longitudinal development of institutional capacity. Another key strength is their flexibility: an assessment framework can be developed to take into account the specific needs of an organisation. Hence, key process areas can be as diverse and

detailed as necessary. The maturity model can be designed to be descriptive (i.e. for only assessing the as-is situation); prescriptive (i.e. provides emphasis on the relationships to business performance and develops a roadmap to improvement); or comparative (i.e. also enables benchmarking across industries or regions). This diversity also provides flexibility in terms of the scope and focus of the model; design methods; number of maturity levels; number of components; extent of maturity model layers; and whether it is staged or continuous. For this reason, maturity models need to be developed from scratch, requiring a significant investment into a scientific and rigorous process. Furthermore, the maturity grid should strike a balance between an often complex reality and the simplicity of the underlying model (Maier et al, 2009). The next section provides more details of the proposed WUM model.

### **The proposed Water Utility Maturity (WUM) model**

IC has been variously conceptualised in extant development literature, ranging from a narrow scope of capacity as individual skills development, to capacity as ‘everything’. As a result, there are quite a number of tools/guidelines for evaluating IC in the water sector, many of which are prone with various shortcomings. These guidelines/tools have been reviewed in another paper by the authors (Kayaga et al, forthcoming) - it is not possible to provide a synthesis of these tools/guidelines in this paper due to space limitations.

As stated above, some of the reviewed tools evaluate narrow aspects of IC, (e.g. operational effectiveness and efficiency), while, for others, the unit of analysis is the whole water sector, which makes the assessment much too broad, unfocused and largely ineffective. Most of the reviewed evaluation tools were externally-driven, not designed for organisational/institutional self-evaluation, and do not emphasize organisational learning. Furthermore, existing tools evaluate IC at a snapshot, and are not designed to monitor improvements in IC over time, nor are they suitable for metric/process benchmarking.

The proposed WUM model differs from most of the reviewed maturity models, which focus on processes for specific capacities of an organisation. The proposed WUM model is generic and evaluates a water utility in terms of five broad dimensions of institutional capacity: (i) behaviour; (ii) structure/processes; (iii) capabilities; (iv) organisational tools; and (v) influence. These dimensions are integrative, mutually exclusive and collectively exhaustive – they were selected based on personal experience of the authors, and informed by a synthesis of the reviewed tools/guidelines for assessing IC of water utilities and other generic international development interventions (see Kayaga et al [forthcoming] for a summary). Each dimension is defined by several attributes, as shown in Figure 3. For instance, the dimension of organisational behaviour is defined by the attributes of strategic orientation, strategic leadership, customer orientation and commercial orientation.

For each attribute of the WUM model shown in Figure 3, five maturity levels have been defined. The maturity levels represent distinct cumulative stages (1 being the lowest stage and 5 being the highest), where higher stages build on the requirements of lower stages. Maturity in this model is evaluated by the degree to which business processes and management systems are structured and institutionalised in the water utility (Maier et al, 2009).

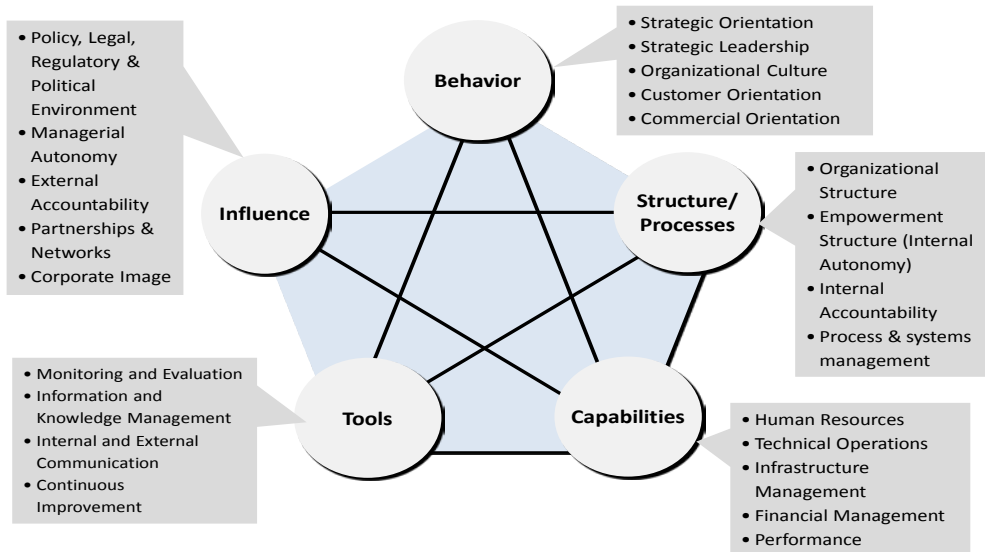


Figure 3: Dimensions and attributes of the WUM Model

We developed defining labels for each maturity level corresponding to the desirable condition of the attributes in the specific level. These definitions are distinct and as clear as possible, so as to enhance interpretation of the results. For example, Figure 4 shows a graphical presentation of the maturity progression for the attribute of strategic orientation, under the dimension of “Behaviour”. At level 1, the utility is largely reactive to the business environment. As it matures, strategies are developed, institutionalised and are continuously adapted to market conditions; and the major stakeholders beneficially organised around the utility’s processes. In essence, the complete WUM model is composed of 115 cells of defining labels (i.e. 5 maturity levels for 23 attributes), but are these not presented here because of space limitations.

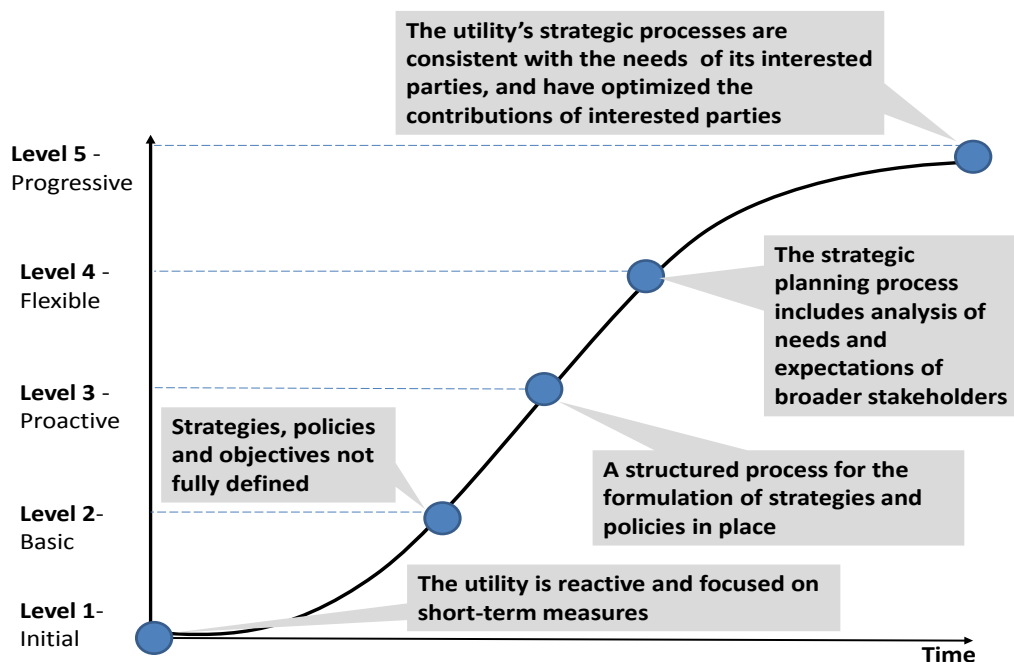


Figure 4: Labelled progressive maturity levels for the attribute of “strategic orientation”

The mechanism for administering the WUM model depends on the aim of the assessment and the resources available for conducting the assessment. The model could be used for self-assessment to capture the perceptions of the utility's staff, or facilitated by a consultant. For a process largely aimed at benchmarking, the model could be administered in form of a questionnaire, so that it may reach a wide variety and a large number of respondents. However, for the purpose of raising awareness and improving performance, interviews and/or group discussions are preferable. Group-administered workshops are usually more process-focused, provide a high response rate, minimise single-respondent biases, and create common reference points, which facilitate interpretation of the resulting scores (Maier et al, 2009).

We have also developed an aggregated WUM model that is suitable for rapid self-assessments by senior management. The outputs of such a self-assessment could be incorporated into a service improvement programme. Annex 1 provides a draft aggregated model, which provides defining labels, in aggregate terms, for the broad dimensions of behaviour, structure/processes, capabilities, tools and influence.

The WUM model has a number of potential applications. The model provides a common language and a shared vision, and enables the identification of capacity development interventions, through a systematic process of assessment, using a holistic framework that covers the entire organisation. It can thus provide an inventory of current capabilities and identify a baseline for measuring institutional capacity development. Secondly, the model may integrate existing and planned institutional development activities, hence improving efficiency and effectiveness. Thirdly, the WUM model may elicit different perspectives, stimulate reflection, and lead to rethinking a utility's management system, philosophy and focus. Fourthly, the WUM model highlights the need for change and fosters a culture for excellence. Fifthly, the model may provide a guide for decision-making, and aid identification of areas for improvement. Lastly, the WUM model can be used to benchmark institutional sustainability and provide an opportunity to translate internal assessment data directly into the formats used by international quality standards such as ISO 9001.

The proposed WUM Model was piloted in February 2012 to assess the institutional capacity of the two large urban water utilities in South Asia. Consultants carried out review of key operational and policy documents, informant interviews, focus group discussions, and observations, which enabled a holistic assessment of the maturity levels for the various attributes contributing to institutional capacity. The perceived maturity levels, which were aggregated into scores for five dimensions of behaviour, structure and processes, technical capabilities, tools and influence, are plotted as a radar diagram, shown in Figure 5. A focus group discussion with senior managers of one of the utilities provided positive feedback on the face and content validity of the model.

The preliminary and rapid assessment showed that the two utilities are operating below Maturity Level Three. While Utility B's behaviour and tools are perceived to be close to a "proactive" maturity level, it is being pulled down by the low level of influence and inefficient organisational structure and processes. On the other hand, Utility A is perceived to be stagnating at the basic level for all the five dimensions.

These findings were presented to, and discussed with Utility A’s senior management, who appreciated and concurred with most results.

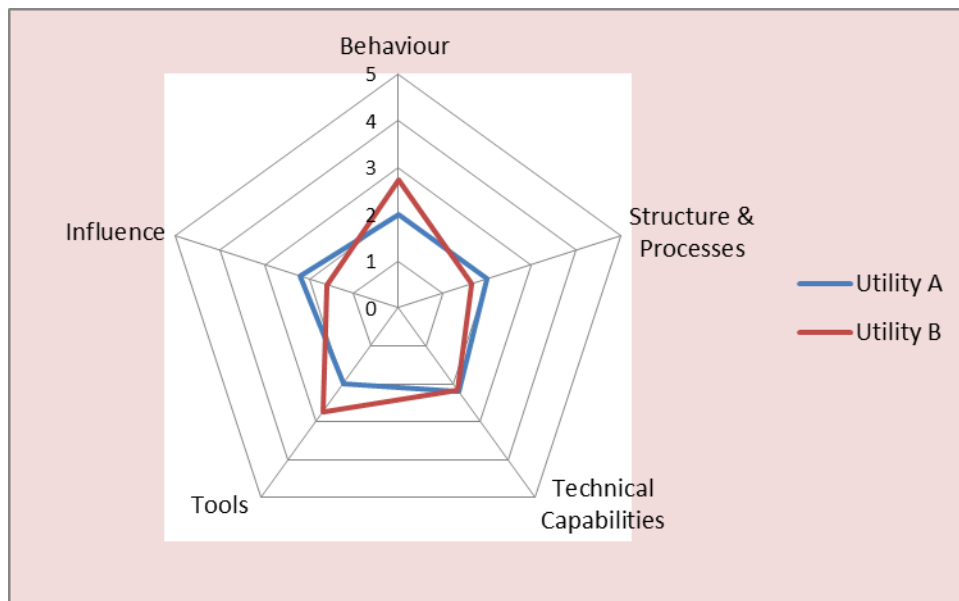


Figure 5: Results of a pilot application of WUM Model by two urban water utilities in South Asia.

More work is required to develop this model. The current descriptions for the various attributes are merely indicative and need to be confirmed. Further exploratory and empirical work is needed. We identify the following steps to be taken in order to further develop the model:

- i. Confirming the model structure (levels, attributes and defining labels) and validity through further empirical work;
- ii. Increasing the model’s flexibility in terms of its scope, e.g. both a diagnostic tool and a benchmarking tool, and its mode of administration – e.g. through self-assessment, third party assisted assessments or by a certified practitioner;
- iii. Creating diagnostic tools to evaluate the characteristics under each maturity level;
- iv. Creating analytical tools to assist in interpretation of data;
- v. Identifying barriers to progressing between maturity levels;
- vi. Identifying enablers to overcome barriers;
- vii. Creating generic ‘institutional capacity development strategies and plans’ for moving between maturity levels; and
- viii. Performing pilot applications of the model, review and modification, where necessary.

The WUM model development and testing process needs to be carried out in coordination with various regional/international water industry professional associations and water operator/utility networks (e.g. International Water Association, African Water Association and Global Water Operators Partnerships), and should include the identification of feasible arrangements and resource commitments for maintaining the model’s growth and its use as an industry standard. The World

Bank's Water Practice could play the role of coordinating the model's development, while regional utility networks could promote the model's use.

## **Conclusions**

This paper reports on a study that examined the different conceptualizations of institutions, institutional sustainability, institutional capacity (IC) and capacity development in the international development literature; and how they could be adapted for evaluating institutional development interventions in the urban water sector. The definitions of these concepts and the approach for implementing institutional capacity development have evolved over time. Currently, the emphasis of many international development agencies is the endogenous aspect of institutional capacity, i.e. how capacity develops from within the institution, rather than being driven by outsiders; and how it develops amidst an uncertain and unpredictable operating environment.

We reviewed a few tools used for evaluating institutional capacity of water utilities and generic international development interventions, and identified some limitations, which mainly originated from the fact that they were externally-driven. To address these limitations, this study adapted a conceptual framework developed by the European Centre for Development Policy Management (ECDPM), which conceptualises IC from a multi-dimensional and endogenous perspective that encompasses the individual, organisational and external operating environment levels (Baser et al, 2008).

Consistent with ECDPM's conceptual framework, the proposed WUM model emphasizes the long-term, endogenous and integrative aspects of institutional capacity, and maps an urban water utility at one of the five defined maturity levels across five broad dimensions of behaviour, structure/process, capabilities, tools and influence. The broad dimensions are broken down into lower-level attributes, which are well defined using high-level diagnostic characteristics, described for each of the five increasing levels of maturity.

The WUM model brings together existing knowledge into a unified evaluation framework, which, with further exploratory and empirical studies, could be developed into a tested and flexible model for both self- and external assessment of IC, allowing for monitoring of step-wise progress. It could also provide a shared vision for the needed transitions in water utilities of low-income countries, leverage capacity development activities, and enable benchmarking across the urban water industry.

The proposed WUM model was piloted in February 2012 with two large water utilities in South Asia. A focus group discussion with senior managers of one of the utilities confirmed face and content validity of the model. However, more empirical work is required to improve the model structure and confirm its reliability and construct validity. There is also need to develop diagnostic tools for evaluating attributes for each maturity level, create analytic tools, identify barriers to progressing to the next maturity level, and develop institutional development strategies/plans for moving between the maturity levels.

When fully developed and empirically tested, the WUM model will be a valuable tool for water utility managers, who, for lack of institutional capacity self-assessment tools

specifically developed for water utility management, have had to adopt generic quality management tools such as ISO 9000 series of standards, most of which are manufacturing-centric. The WUM model could also be used by international donor agencies, and has various potential applications, such as a tool for identifying capacity development activities, stimulating reflection on the management philosophy and focus, organisational learning, benchmarking, and using it as a common language for a shared vision.

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Annex 1: Aggregated characteristics of the proposed WUM model

Attributes	Maturity level				
	Level 1 Initial	Level 2 Basic	Level 3 Proactive (Basic+...)	Level 4 Flexible (Proactive +...)	Level 5 Progressive (Flexible+...)
<b>Behaviour</b>	<ul style="list-style-type: none"> <li>Utility is reactive</li> <li>Leadership roles not well defined</li> <li>No commercial orientation</li> <li>No customer orientation</li> <li>No learning culture</li> </ul>	<ul style="list-style-type: none"> <li>Some strategic orientation (short-term)</li> <li>Competent managers</li> <li>Focus on service delivery, owners and some customers</li> <li>Commercial policies and strategy exist but not fully implemented</li> <li>Learning and improvement activities are ad hoc</li> </ul>	<ul style="list-style-type: none"> <li>Structured process for formulation of long term strategy and policy</li> <li>Clear vision, mission and strategy</li> <li>Customer orientation</li> <li>Commercial orientation</li> <li>Basic improvement processes based on corrective and preventive actions</li> </ul>	<ul style="list-style-type: none"> <li>Strategic process includes needs and expectations of broader stakeholders</li> <li>Flexible and performance – oriented utility</li> <li>Improvement is triggered by customer satisfaction data and KPIs</li> <li>Improvement efforts integrated in key processes and aligned with strategy, culture and structure</li> </ul>	<ul style="list-style-type: none"> <li>Balanced focus on emerging challenges</li> <li>Openness to change, adaptive</li> <li>Learning and innovation culture</li> <li>Continual improvement based on culture of learning and sharing</li> </ul>
<b>Structure/ Processes</b>	<ul style="list-style-type: none"> <li>No defined structure</li> <li>Centralized authority</li> <li>No internal accountability mechanisms</li> <li>Ad hoc/disjointed activities and processes</li> <li>Few stable processes exist or are used</li> </ul>	<ul style="list-style-type: none"> <li>Organizational structure is defined</li> <li>Some internal accountability and autonomy</li> <li>Basic processes and procedures in place</li> </ul>	<ul style="list-style-type: none"> <li>Structure is updated regularly to match changing needs.</li> <li>Performance management system and accountability processes in place</li> <li>Different levels of management are delegated</li> <li>Key utility processes are defined and managed</li> </ul>	<ul style="list-style-type: none"> <li>Organic structure, supports effective and efficient processes</li> <li>Performance management systems with in-built incentives for individual and group performance</li> <li>Process planning is integrated with strategy development</li> <li>Leadership empowers staff to act with responsibility and accountability</li> </ul>	<ul style="list-style-type: none"> <li>Structure enhances positive engagement with customers and other stakeholders environment</li> <li>Performance management also considers a process approach.</li> <li>Structure and systems support continuous learning and innovation</li> <li>High level of delegation and autonomy provided to empowered staff</li> <li>Processes are continuously and systematically improved</li> </ul>
<b>Capability</b>	<ul style="list-style-type: none"> <li>Low capability of staff</li> <li>Roles unmatched with technical competences</li> <li>Success depends on individual heroics.</li> <li>“Fire-fighting is a way of life.”</li> <li>Relationships between disciplines are uncoordinated, perhaps even adversarial.</li> <li>Ad hoc, chaotic management</li> </ul>	<ul style="list-style-type: none"> <li>People resources defined and assigned in ad hoc way</li> <li>Success depends on individuals</li> <li>Basic SOPs exist</li> <li>Breakdown/reactive maintenance practiced</li> <li>Financial resources defined and assigned in an ad hoc way</li> <li>Some predictable performance results</li> </ul>	<ul style="list-style-type: none"> <li>HRM processes defined, measured and reviewed</li> <li>Required technical competences identified, actively sought for and attracted to stay</li> <li>Training is planned and provided according to roles.</li> <li>Commitments are understood and managed.</li> <li>People are trained</li> <li>SOPs for all utility processes implemented</li> <li>Preventive maintenance management</li> </ul>	<ul style="list-style-type: none"> <li>HR processes are integrated fully with day-to-day operations</li> <li>Periodic review of the efficiency and effectiveness of the work environment</li> <li>A strong sense of teamwork exists</li> <li>Staff encouraged and provided with resources to continuously develop competences</li> <li>Holistic asset management and planning is implemented</li> <li>Agility, flexibility and innovation is supported by the management system</li> <li>Consistent, positive performance</li> </ul>	<ul style="list-style-type: none"> <li>A strong sense of teamwork exists across the utility</li> <li>Evidence of improving trends of staff motivation and involvement</li> <li>Everyone is involved in process improvement.</li> <li>Leadership motivates and supports staff to create innovations in technical processes</li> <li>Recognition systems are in place for teams and individuals generating strategically relevant improvements;</li> <li>Learning is considered important and supported by top management, who lead by example</li> <li>Risk assessment and</li> </ul>

	<p>of infrastructure</p> <ul style="list-style-type: none"> <li>• Chaotic, short-term financial management</li> <li>• Performance dimensions not well defined</li> <li>• Anecdotal (random) evidence of results</li> </ul>		<p>systems in place</p> <ul style="list-style-type: none"> <li>• Quality management systems implemented</li> <li>• Resource allocation for critical infrastructure development</li> <li>• Processes exist for predicting, monitoring and controlling financial resources</li> <li>• Performance results are predictable</li> </ul>	<p>results, sustained trends</p>	<p>management being implemented</p> <ul style="list-style-type: none"> <li>• Financial resource risks are identified, future financial needs are forecast and planned</li> <li>• Performance results are above sector average achieved and maintained in the long-term</li> </ul>
<b>Tools</b>	<ul style="list-style-type: none"> <li>• Limited use of technology and systems</li> <li>• Introduction of new technology is considered risky</li> <li>• Operational data collection and analysis are ad hoc.</li> <li>• Evaluation of performance rarely conducted; principally externally driven</li> <li>• Knowledge sharing is not actively encouraged, and no tools in place</li> <li>• There is no policy or tools for information dissemination</li> </ul>	<ul style="list-style-type: none"> <li>• Basic technology and systems in place, and in use</li> <li>• Monitoring is performed on a sporadic basis, with no processes in place.</li> <li>• There is a policy to encourage knowledge sharing, but is not fully implemented ; sharing still ad hoc</li> <li>• There is a policy in place, but not implemented ; communication takes place in a reactive way</li> </ul>	<ul style="list-style-type: none"> <li>• Integrated IT systems and operational systems and tools are in place</li> <li>• Operational data is collected and used in all defined processes.</li> <li>• Operational data is systematically shared across the utility</li> <li>• A periodic monitoring process in place, focused on customer needs and expectations;</li> <li>• Systematic data analysis used to identify needs and expectations of interested parties.</li> <li>• A process to identify, obtain, protect, use and evaluate information and knowledge is implemented.</li> <li>• A process for external and internal communication is defined; IT systems are protected.</li> </ul>	<ul style="list-style-type: none"> <li>• Data definition and collection are standardized across the utility</li> <li>• Data is used to understand the utility processes qualitatively and stabilize/improve them</li> <li>• The monitoring process is regularly evaluated</li> <li>• Information and knowledge are shared within the utility and periodic reviews take place;</li> <li>• Effective system and tools are in place to communicate the changes in strategy and plans to relevant staff.</li> </ul>	<ul style="list-style-type: none"> <li>• New technologies are proactively pursued and deployed</li> <li>• Data is used to evaluate and select process improvements</li> <li>• The monitoring process is performed in a systematic and planned manner, and includes cross-checks with external data sources;</li> <li>• Improvements in management system are propelled by systematic benchmarking</li> <li>• Information and knowledge are shared with partners and other interested parties;</li> <li>• Information and knowledge is processed to meet future needs;</li> <li>• Changes in policy are communicated to relevant interested parties, and to all levels of the organization.</li> <li>• The effectiveness of the communication process is reviewed periodically.</li> </ul>
<b>Influence</b>	<ul style="list-style-type: none"> <li>• Leadership and staff not well conversant with factors in the external environment.</li> <li>• Partnerships and networks with outside organizations are not supported</li> <li>• Corporate</li> </ul>	<ul style="list-style-type: none"> <li>• Leadership passively interested in factors in the external environment, and reacts to them rather than strategically influencing them.</li> <li>• Partnerships and networks may be</li> </ul>	<ul style="list-style-type: none"> <li>• The external environment is actively monitored to develop understanding and reduce uncertainty</li> <li>• There is a policy that encourages and supports mutually beneficial partnerships and networking;</li> </ul>	<ul style="list-style-type: none"> <li>• Leadership continuously scanning the external environment, and adapting to changes through building organizational capacity for effective negotiation, and alignment of business processes, building networks and allies</li> </ul>	<ul style="list-style-type: none"> <li>• Utility has predictive capabilities, and carries out risk/opportunities assessment and management; continuously adaptive to the external environment in near real-time;</li> <li>• Partnerships are integrated within business processes</li> <li>• The results of the corporate image scans</li> </ul>

	<p>image is not recognized as an important service element and is not evaluated</p> <ul style="list-style-type: none"> <li>• Utility managers lack autonomy to make important managerial and operational decisions</li> <li>• Negative political influence is common</li> <li>• There is no external accountability for performance</li> </ul>	<p>initiated by individual staff;</p> <ul style="list-style-type: none"> <li>• Supplier communications are limited to tendering, order placement or problem resolution</li> <li>• Leadership is aware of the importance of corporate image; however, it is not monitored or evaluated in a consistent and systematic manner</li> <li>• There is limited managerial and operational autonomy</li> <li>• External accountability mechanisms in place but not effective</li> </ul>	<ul style="list-style-type: none"> <li>• Processes are in place to select, evaluate and rank suppliers</li> <li>• Corporate image is periodically measured ; but the results are not necessarily used for improvements</li> <li>• Managers have more room to maneuver and innovate (i.e. have autonomy to effect internal managerial/operational changes to improve the effectiveness and productivity</li> <li>• The utility is held accountable for performance by some of the external stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>• There is a budget to develop and grow partnerships and networks;</li> <li>• Relationship processes exist to develop key suppliers</li> <li>• Corporate image is continuously and systematically tracked. The results are widely made available inside the organization and used in the strategic planning process</li> <li>• Utility has full autonomy with respect to most managerial, operational and financial decisions</li> <li>• Utility is held accountable for performance by some external stakeholders</li> </ul>	<p>are integrated into the performance/incentive management system for staff</p> <ul style="list-style-type: none"> <li>• Utility has full autonomy with respect to all managerial, operational and financial decisions</li> <li>• Utility has a balanced accountability framework</li> </ul>
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