CAN ISO 9001 CERTIFICATION OF WATER UTILITIES IN DEVELOPING COUNTRIES BE USED TO EVALUATE INSTITUTIONAL SUSTAINABILITY?

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Abstract: Provision of reliable water services is critical for sustainable development. Next year (2015), the United Nations will review achievement of the Millennium Development Goals (MDGs). Based on previous trends, The WHO/UNICEF Joint Monitoring Programme estimates that about 700 million people will not have access to safe drinking water in 2015. During the post-2015 era, urban water utilities in less developed regions of the world will face greater challenges in extending and sustainably 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). Consistent with various scholars, we argue in this paper that there can be no sustainable development in any sector without the support of effective and sustainable institutions.

Whereas indicators for measuring improved quality of service are established in policy and practice, there has been no agreement between policy makers, practitioners and academicians on how best to measure institutional sustainability for improved organisational performance. An increasing number of urban water utilities in developing countries are adopting quality management systems (QMS) based on ISO 9000 series of standards in order to improve their performance. This paper reports on the results of a study commissioned by the World Bank to assess whether ISO 9001 QMS offer a sound framework for evaluating institutional sustainability of urban water utilities.

The study was conducted in 2011/12 through a comprehensive literature review and primary data collection from two case study urban water utilities in sub-Saharan Africa. Primary data were collected through semi-structured interviews and questionnaires with senior and middle-level managers; Focus Group Discussions (FGDs) with lower cadre staff of the utilities; and analysis of Key Performance Indicators (KPIs) before and after ISO certification.

Evidence from the literature showed that there is a plausible link between ISO 9000 QMS standards and institutional sustainability. Field data from the two African water utilities corroborated the findings from the literature. However, findings from the case studies indicate that there is no causal link between ISO 9001 certification and institutional sustainability. The study shows that the purpose and motivation for implementing ISO 9001 QMS are important moderating factors. Furthermore, ISO 9001 framework does not adequately cater for many factors in the external environment of the service providers, which are critical for institutional sustainability. There is need, therefore, to develop a more effective assessment tool for tracking a water utility's progress towards institutional sustainability.

Keywords

Institutional Capacity, Institutional Sustainability, ISO 9000 Quality Management Systems, Sustainable Development, Urban Water Utilities

INTRODUCTION

Sustainable Development (SD) has been defined in various ways. The most frequently cited definition is the one developed by World Commission on Environment and Development (WCED) which conceptualises SD as development that '…meets the needs of the present without compromising the ability of future generations to meet their own needs' [1]. One of the five items prioritised for SD by The United Nations Commission on Sustainable Development (CSD) is fresh water. Others are climate, clean air, land productivity and biodiversity [2]. 'Water is life', and human beings require an adequate quantity of portable water for survival, healthy wellbeing and good livelihoods. Also, lack of adequate water supplies directly or indirectly, negatively affects the achievement of targets for Millennium Development Goals (MDGs) on eradication of extreme hunger and poverty; achievement of universal primary education; promotion of gender equality and empowerment of women; reduction of child mortality; improvement of maternal health; combating HIV AIDS, malaria other diseases; and ensuring environmental sustainability.

Most countries in the developed regions of the world have achieved universal service coverage. However, according to the most recent report of WHO/UNICEF Joint Monitoring Programme, about 765 million people in the world, most of them living in developing countries, relied on surface water or unimproved water sources in 2011[3]. It is anticipated that this number will have reduced to about 700 million by 2015, when the MDGs are reviewed [4]. During the post-2015 era, urban water utilities in less developed regions of the world will face greater challenges in extending and sustainably providing water services, given the escalating urban populations coupled with negative impacts of climate change. UN-HABITAT estimates that the urban population in developing countries will increase from 2.57 billion in 2010, to 3.95 billion in 2030, with about 55% of these countries' inhabitants living in urban areas by 2030 [5, 6].

Delivery of water services in urban areas of developing countries is even more challenging, given that population increase in cities and towns of most developing countries is absorbed by low-income urban settlements or slums. A slum household is defined as a group of individuals living under the same roof, in deprivation of basic infrastructure services such as improved sanitation, basic piped water supply, sufficient living area, and security of tenure [7]. The recent update by UN-HABITAT shows that the proportion of slum dwellers in urban areas of developing countries declined from 39.4% to 32.6% during 2000-2010. However, the absolute numbers of slum dwellers actually increased from 770 million to 840 million in the same period [7]. Providers of infrastructural services such as water, sanitation and roads face enormous challenges in extending services to the escalating informal, high-density and often unplanned settlements - these are mainly in terms of physical, technical, economic, institutional and legal constraints encountered [8].

Efforts towards achievement of MDGs have in the recent past been focussed on promoting first-time access to safe drinking water. Increasingly, water sector professionals are moving their focus from mere access, to sustainable service delivery, which requires covering wider aspects, including the institutional contexts in which service delivery occurs [9]. This paper adopts the position that the institutional context in which development interventions take place is one of the key pillars for sustainable development, the others being social, economic and environmental dimensions [10]. We argue that institutional sustainability is critical for making good and viable investment decisions; creating a good enabling environment; and providing adequate levels of urban water services to the population on a sustainable basis. Hence, there is need to consider institutional sustainability as one of the yardsticks by which development interventions, such as urban water supply services, are evaluated [11].

Whereas indicators for measuring improved quality of service are established in policy and practice, there has been no agreement between policy makers, practitioners and academicians on how best to measure institutional sustainability of water utilities. An increasing number of urban water utilities in developing countries are adopting quality management systems (QMS) based on ISO 9000 series of standards in order to improve their performance. This paper reports on the results of a study commissioned by the World Bank to assess whether ISO 9000 QMS could offer a sound framework for evaluating institutional sustainability of urban water utilities. The primary question for this study was:

Do ISO 9000 quality management systems offer a sound framework for evaluating institutional sustainability at the water utility level?

This primary question is broken down into three secondary questions:

1. How is institutional sustainability conceptualised in extant literature?
2. How has institutional capacity, and by extension, institutional sustainability of water service providers and other relevant international development projects been evaluated in the literature?

3. Do ISO 9000 series of quality management guidelines offer a useful framework for continual improvement and increased likelihood of institutional sustainability at the water utility level?

The rest of the paper is structured as follows: Section 2, the next section, describes the methods used for collecting data. Section 3, which presents and discusses the findings, is comprised of the following four sub-sections: (i) we present and discuss different conceptualisations of Institutional Sustainability as presented in extant literature; (ii) we discuss various tools/guidelines reported in the literature that are relevant for evaluating Institutional Capacity of water service providers; (iii) we present results of a literature review on the link between ISO 9000 quality management systems and Institutional Capacity; and (iv) we present results from case studies on the link between ISO 9000 quality management systems and Institutional Capacity. In Section 4, the last section, we synthesize the evidence and draw conclusions therefrom.

METHODS

This study was conducted from 2011 to 2012, and was composed of two main parts: a literature review and collection of primary data from two African water utilities which gained ISO 9001 certification in 2003 and 2002, respectively. These utilities are kept anonymous in conformity with the requirements of research ethics, and referred to as Utility A and Utility B. The literature review was grounded into the qualitative paradigm and closely followed steps recommended by various scholars such as Ogawa and Malen [12]: (i) creating an audit trial; (ii) defining the focus of the review; (iii) searching for relevant literature; (iv) classifying the documents; (v) creating summary bases; (vi) conceptualising constructs and identifying hypothesized causal linkages; (vii) searching for rival contrary findings and rival interpretations; and (viii) using colleagues to collaborate findings. At a later stage, qualitative content analysis was used to assess whether quality management principles advanced by ISO 9000 series of standards offer a sound framework for continual improvement and increased likelihood of institutional sustainability at the water utility level.

We used a variety of literature sources for the study. These included hardcopy books, monographs from the Loughborough University Library, as well as relevant articles and journal papers obtained through key word searches, from electronic data bases such as Google scholar, Journal Citation Reports (JCR), Publish or Perish, SCImago Journal and Country Rank, Scopus and Loughborough University e-journal database. The initial document search came up with over three hundred articles, books and monographs. Upon reading the abstracts, some literature that was deemed less relevant was removed, leaving 178 journal articles, book chapters and monographs. Other important documents were received from professional colleagues. By scheme reading, these articles were further culled down, bringing the total list of documents that were saved for further scrutiny to 148.

A variety of data collection methods were used to collect data from the two case study utilities in sub-Saharan Africa. The data collection tools were developed based on the findings of the literature review. These included interview guides, questionnaires, a guide for reviewing organisational documents, a focus group discussion guide, and a list of key performance indicators for verifying organisational performance since ISO 9001 certification. Table 1 shows details of sources of data from the two case study water utilities.

Table 1: Multiple sources of key data for the two case studies

Data Collection Methods	Utility A	Utility B
1. Staff interviews	6 Senior Managers (incl. MD)-HQ 2 Middle Managers - HQ 2 Senior Managers – Service Areas	Director General & his 2 Deputies 10 Heads of Department (Directors) 6 Departmental Staff
2. Respondents to Questionnaire on perceived benefits	Quality Control Manager 2 Senior Manager – Service Areas 7 Middle Managers – Service Areas	Group response from MD & his Deputies Quality Manager Responses confirmed by 3 Directors
3. Documents reviewed	21 official documents	30 official documents
4. Focus Group Discussions	Quality Manager, 3 x 2 middle managers from HQs & Service Areas,	1.5hrs with 11 frontline staff across the various departments
5. Objectively verifiable performance indicators	10 indicators on service quality and efficiency	25 indicators on service coverage, service quality and efficiency

RESULTS AND DISCUSSION

Conceptualisations of Institutional Sustainability (IS)

Since 1984 when the UN set up the World Commission on Environment and Development (WCED, also known as the Brundtland Commission, named after its first chairperson) to focus on environment and development issues, there has been lots of debate on how to define Sustainable Development (SD). The most dominant conceptualisation of SD continues to be the one developed by WCED which described SD as development that meets the needs of the present without compromising the ability of future generations to meet their own needs [1]. The work by the Brundtland Commission has since generated a lot of debate on how to operationalise sustainable development. However, the institutional dimension of SD did not receive much attention, until the early years of the new Millennium, when international development agencies started highlighting the importance of institutional sustainability [13]. For instance, the World Bank in its 2003 World Development Report emphasized the need to transform institutions in order to achieve sustainable development in a dynamic world [14]. Since the early 1990s, scholars such as Pfahl [13] and Brinkerhoff and Goldsmith [15] have underpinned the importance of institutional sustainability in development, and have argued that there can be no sustainable development in any sector without the support of effective institutions. The next few paragraphs review how the terms 'institutions' and 'sustainability' has been defined and applied in the literature, as this is a logical step to understanding the concept of institutional sustainability.

What are Institutions?

It is not possible to provide a universal 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. Aoki [16] used the analogy of a game to show how 'institutions' have been variously conceptualised, ranging from (a) players of the game; (b) the rules of the game; or (c) the outcome of the game. Use of the third analogy is less prevalent – it is mainly applied by welfare economists, who contend 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' [17, p.21-22, 18].

Consistent with 'the players of the game' analogy, some scholars define the term 'institutions' to mean political or social organisations that are involved in policy making and implementation, i.e. as groups of individuals bound by some common purpose to achieve set objectives, who have a legal personality and staff that act to enforce the rules and implement the entities' goals [19, 13]. Other scholars have defined organisations as the most tangible class of institutions. For example, Spangenberg et al [20, p.71] has defined institutions 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.

The conceptualisation of 'institutions as organisations' is considered to be narrow by most scholars, who contend that institutions are much broader than organisations, and that the institutional framework influence what organisations come into existence and how they evolve over time; but that organisations also subsequently shape how the institutional framework evolves [19]. A commonly cited definition that is aligned with the 'the rules of the game' analogy is one which describes institutions as '…the rules of the game in society or, more formally, are the humanly devised constraints that shape human interaction' [19, p.3]. In this case, institutions could be created, such as national constitutions, or they may evolve over time, such as a common law; they could be formal, such as rules that human beings devise, or informal, such as conventions and codes of behaviour [19]. Other institutional economists like Neale [21] and Pagan [17] have adopted this conceptualisation and consider institutions to include laws, customs, social conventions, regulations and rules that structure society's behaviour.

Other scholars align their definition of institutions to both analogies (i.e. the role players and the rules). For instance, Huntington [21] 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 [15, 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 [15, 20]. Also, Pfahl [13] noted that institutions build the framework for human actions in different contexts, and are patterns of behaviour that implicitly assume a regulatory role.

Spangenberg et al [20] came up with a more inclusive definition, in which institutions are described as the rules by which decision-making and implementation is structured; the rules could refer to social entities as actors, or as systems of rules shaping behaviour. In addition to describing systems of rules as organisations, they could be described in terms of institutional mechanisms or institutional orientations. Mechanisms are explicit or formal systems of rules, while orientations are implicit or informal systems of rules that structure the choices of actions of individual or collective actors in a society. This paper adapts the conceptualisations by Spangenberg et al, [20] and Brinkerhoff and Goldsmith [15] and 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.

How can Institutional Sustainability be conceptualised?

Next, we discuss various conceptualisations of 'sustainability'. Agenda 21, an action plan for sustainable development drawn by the United Nations Conference on Environment and Development (UNCED), which was held in Rio de Janeiro (Brazil) in 1992, is explicit about the ecological/environmental, social and economic dimensions of sustainability, but is unclear about the institutional dimensions [13, 20]. Yet the institutional setting in which development policies are conceived, funded, implemented and managed is important for sustainable development [23, 24]. In the context of governance for sustainable development, institutional sustainability in generic terms refers to the activities of a particular institution with respect to enablement and facilitation of decision making, as well as implementation of sustainability policies [13]. In the remainder of this sub-section, we briefly discuss four broad definitions of sustainability commonly presented in the literature, and their implications on evaluation of institutional sustainability.

A study on integrated rural development carried out way back in the early 1980s defined sustainability as continuation of the benefit flows to the users/clients with or without the organisations or programmes that conceived them in the first place [25]. This was the most common definition espoused by many international donor agencies before the 1990s, which fits well with the project cycle approach to planning and development. For instance, USAID defined sustainability as the ability of a project to deliver services or sustain benefits after the investment phase [26]. In the first instance, international development interventions implemented under the project cycle approach usually consider recipient organisations/institutions as mere implementing partners, which breeds a situation where institutional sustainability is not catered for. Secondly, evaluation of continued flow of benefits after the project is completed is logically inconsistent with the funding model of the project cycle approach, given that no investment is made for activities after the project cycle. Thirdly, it is practically difficult to evaluate 'continued flow of benefits' during the implementation period [24].

In the second dominant view, sustainability is defined in terms of the longevity, and, institutional sustainability conceived in terms of institutional survival [24]. Put differently, if an organisation survives as an identifiable unit for a long time, it is considered to be institutionally sustainable [15]. Brown [24] discussed several flaws and inconsistencies arising out of this viewpoint. Firstly, this conceptualisation does not specify how long an organisation has to survive in order to qualify as institutionally sustainable. Secondly, survival of an organisation by itself is inadequate - the sustainability of an institution needs to be tied to some minimum performance level of performance. Thirdly, for some organisations, longevity is neither necessary nor desirable, as they may have been set up to achieve a specific purpose in a given timeframe. Fourthly, evaluating the longevity of an institution ex-ante is practically difficult.

Another common view is the one in which sustainability of development interventions is conceived in terms of revenue self-sufficiency after donor funding has stopped, especially with respect to recurrent costs [24]. This view is informed by common instances in which infrastructural facilities constructed as part of development interventions fall apart due to poor operation and maintenance practices, which are usually caused by low cost recovery for service delivery. The financial view of sustainability is attractive to those carrying out evaluation of projects/programmes, mainly because it is easier to measure compared to other dimensions of sustainability. It is no doubt that cost recovery contributes to the financial viability of a project/programme. However, viability should not be mixed up with sustainability. For some developmental projects, emphasis on cost recovery can lead to exclusion of poor households, and therefore negate the development objectives [24].

Increasingly, many scholars are adopting the view that sustainability is about '…the capacity of an institution to generate a minimum level and quality of valued outputs over the long term' [13, 15, 25 p. 62,]. A sustainable

institution will have the required capacity to coordinate human interaction so that specific sustainability objectives can be achieved [13]. Sustainable institutions create adequate levels of capacity to effectively deliver specific products/services, maintain this capacity at an acceptable level, and convert that capacity into actual performance [25]. According to Spangenburg et al [15], it is important to enrich 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.

Furthermore, Brinkerhoff and Goldsmith [23] stated 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 [27], 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 [24] reinforced this position, and stated 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 [24].

In summary, it can be deduced from the literature reviewed and summarised above that institutional sustainability is an abstract attribute, which presents practical difficulties for monitoring and measuring its progress. The position taken in this paper is similar to the one espoused in the previous paragraph, which regards institutional sustainability as closely linked with institutional capacity. Owing to the practical difficulties encountered in measuring Institutional Sustainability, discussed in the preceding paragraphs, we propose to use a composite leading indicator to monitor and evaluate institutional sustainability. This is the position taken by most researchers and practitioners to evaluate institutional sustainability, such as those described in the next section. Leading indicators are those that signal an event – they are usually output-oriented, easier to influence and harder to measure, compared to lagging indicators. Leading indicators are widely used in the disciplines of economics and performance management, such as in the balanced scorecard methodology [28]. Based on the concepts by Brown [24], Brinkerhoff and Goldsmith [15], Hill [27], Pfahl, [13], and Spangenburg et al [20], this paper conceptualises institutional capacity as a composite leading indicator of institutional sustainability. Institutional capacity may be defined 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. The next sub-section describes how institutional capacity for water service providers and other relevant international development interventions is conceptualised and evaluated in extant literature.

Evaluation of Institutional Capacity for urban water services and other relevant development projects

Conceptualising institutions as a combination of organisations, mechanisms (i.e. formal systems of rules) and orientations (i.e. informal systems of rules) implies that the scope of evaluation for institutional capacity will cover individuals and organisations, and also extend to the external environment. In line with this conceptualisation, the capacity of an institution may be defined as '…the ability of individuals, organisations and broader systems to perform their functions effectively, efficiently and in a sustainable way [29]. The external environment presents multiple contexts that influence how organisations and the individuals in them (i.e. the external actors) operate and affect organisational performance. External factors impacting on an organisation are often linked to the overall governance framework in the country. Governance refers to '…power and authority and how a country manages its affairs… (and) …considers all the mechanisms, processes, relationships and institutions through which citizens and groups articulate their interests and exercise their rights and obligations'[30, p.6]. The Global Water Partnership defines water governance as 'the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society' [31, p.7].

Compared to other services in the public sector such as energy and telecommunications, provision of water services may suffer from more effects due to factors in the external environment. Examples of characteristics that make water services 'unique' are (i) water is perceived to be a fundamental right; (ii) water services could be classified as a public/merit good or as a private good; (iii) provision of adequate water supply has important externalities, both to the general welfare of society, and globally, to the natural environment; and (iv) provision of water services is a natural monopoly, with large up-front fixed investment requirements [32]. Also, the UN recently took the position that poor delivery of water services in many developing countries is essentially as a result of a governance crisis, manifesting itself in shortcomings such as fragmented institutional structures, lack of clarity of roles and responsibilities, inequitable resource allocation, weak accountability structures and unclear/non-existent regulatory mechanisms [33]. The remainder of this sub-section summarises the main tools/guidelines reported in the literature, which are used for evaluating institutional capacity, and by extension institutional sustainability of urban water utilities or for relevant generic international development projects. The tools/guidelines are listed by the organisations that developed them, and are presented in a chronological order.

Water and Sanitation for Health Project, USAID (1988)

One of the earliest documented attempts made at measuring institutional capacity in the water sector was the USAID-funded Water and Sanitation for Health (WASH) Project, which, in 1988 developed the WASH Technical Report No. 37 on 'Guidelines for Institutional Assessment - Water and Sanitation Institutions' [34]. WASH Technical Report 37 defined institutions as 'those organisational entities which are responsible for providing water and sanitation services in either urban or rural areas' [34, p. 4]. Hence, using the rule/role-based definition of institutions, the guidelines assess broader areas of institutional capacity for operational performance, including factors existing in the external environment. Organisational autonomy is rated as one of the most important dimensions of Institutional Capacity. Others are leadership, management and administration, commercial orientation, consumer orientation, technical capability, developing and maintaining staff, organisational culture, and interactions with key external institutions. Comprehensive guidelines were provided on the data collection methods, complete with detailed checklists for measuring each dimension.

International Development Research Centre, Canada (1995)

Another comprehensive instrument to measure institutional capacity was developed in the mid-1995s by the International Development Research Centre (IRDC). IRDC is a Canadian government-owned international research organisation, which supports local researchers in developing countries to find practical long-term solutions to the social, economic and environmental problems faced by society [35]. The assessment framework was primarily developed as a tool for monitoring, assessing and strengthening the organisational capacity of IRDC's research partners in developed countries. This assessment is pivoted on the premise that 'capacity strengthening is an ongoing process by which people and systems, operating within dynamic contexts, learn to develop and implement strategies in pursuit of their objectives for increased performance in a sustainable way' [36, p. xiii].

The framework uses four dimensions to assess institutional capacity. A dimension on key forces in the external environment deals with aspects of the administrative/legal, technical, political, economic socio-cultural and stakeholder environments. Another dimension, on organisational motivation assesses the historical trajectory of the organisation; the mission – stated and perceived; the organisational culture; and the incentive mechanisms. The third dimension on organisational capacity assesses the strategic leadership; human resources; other core resources such as infrastructure, technology and finance; programme management; process management and inter-institutional linkages. Finally, the IRDC looks at overall organisational performance, which is considered as a function of the interplay of the organisation's unique motivation, its organisational capacity and forces present in the external environment. Performance is evaluated against indicators of effectiveness, efficiency, and adaptability [36].

Norwegian Development Cooperation (2000)

The Norwegian Development Cooperation (NORAD) developed a handbook for assessment of institutional sustainability, primarily for the benefit of NORAD's programme officers and technical advisors, to be used for NORAD-supported development projects. In line with their conceptualisation of institutional capacity presented in the previous section, NORAD defined institutional development as '…the process by which individuals, organisations and broader systems increase their capacities and performance in relation to goals, resources and environment' [29, p.5]. Hence, according to NORAD, institutional development consists of a broad range of change activities at the levels of individual actors, organisations and social systems. Based on this framework, NORAD developed a comprehensive tool for assessment of institutional capacity, which is summarised in Table 2.

Table 2: NORAD's Checklist for Institutional Sustainability (Source: NORAD [29])

Dimensions	Sub-dimensions
1. Organizational strategy	• Purpose, goals and strategy
2. Organizational management	• Capacity of executive bodies • Systems and procedures • Organizational structure
3. Financial Resources	• Financial resources • Economic independence
4. Infrastructure	• Technical infrastructure • Administrative equipment

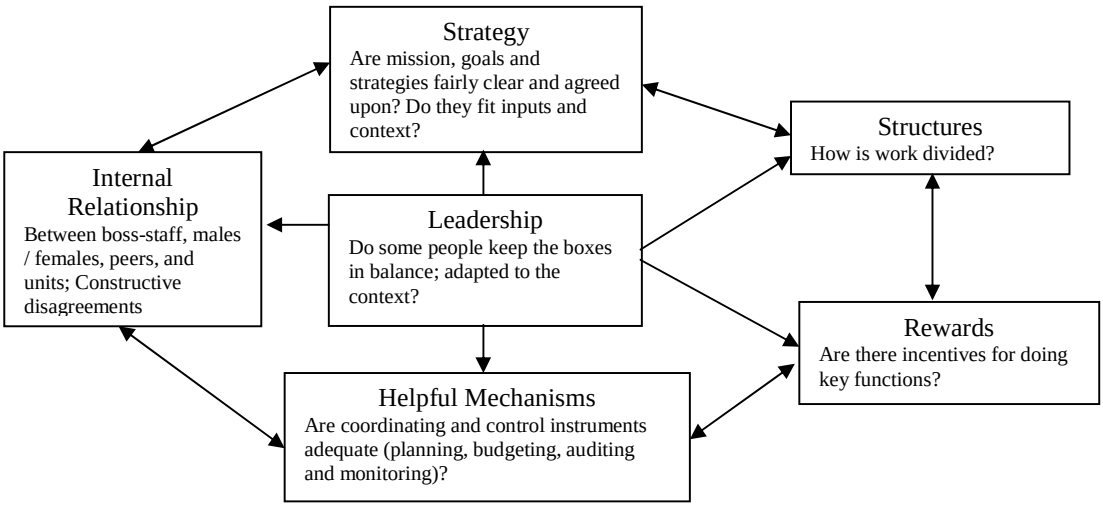
Dimensions	Sub-dimensions
5. Performance	• Performance and productivity • Performance demands and control
6. Competence	• Institutional competence
7. Personnel	• Technical personnel • Managerial and administrative personnel • Personnel policies, incentives and compensation
8. Culture and communication	• Corporate culture • Communication, cooperation and authority
9. Linkages/Networks	• Alliances and connections • Competitors and rivals • Relations to donors
10. Legal and political framework	• Legal basis and constraints • Political support
11. External cultural framework	• Community rules and norms • Rules and norms in official agencies
12. Participation and legitimacy	• Local ownership and participation • Legality and trust in community

UK Department for International Development, (2003)

The UK Department for International Development (DFID) put together a sourcebook that outlines key tools to be used by those involved in institutional capacity development. Many of these are generic tools commonly used for institutional development, such as the SWOT analysis, Problem tree analysis, Force Field Analysis and Stakeholder Analysis [37]. One tool for analysis and diagnosis that is relevant for assessment of institutional capacity is the Open Systems Model, which is structured along eight dimensions. Checklists are provided to assess the organisation with respect to (i) strategic and institutional environment; (ii) financial resources and systems; (iii) role and strategy; (iv) organisational and national culture; (v) people and human resource management; (vi) management systems and practices; (vii) organisational structure; and (viii) outputs/ performance.

Europe-Aid, the European Commission (2005)

Figure 2: The Six-Box Model (Source: European Communities [38])



As part of their tools and methods series, the EU developed the Reference Document No 1, which contains a conceptual framework for carrying out institutional capacity assessment of public sector organisations. In this

reference document, institutions are conceptualised as resilient social structures formed by norms and provide solidarity and meaning to social life [38]. Using an open-systems approach, the framework recommends looking at organisations in their context, initially paying particular attention at the structural (e.g. history of state formation, natural and human resources) and institutional factors (e.g. norms of exertion of power and authority, socially embedded norms, regulatory regimes) that shape the present organisational capacity and provide drivers of change as well as constraints to change. It is recommended that the factors in the external environment should be assessed first, prior to examining the inside of the organisations, which may be assessed using the six-box analytical model, shown in Figure 2. Leadership is perceived as the most important element that holds together all the other boxes.

The World Bank, 2006

In a study on characteristics of well-performing public water utilities, Baietti et al [39] found that the degree of autonomy from, and the utility's accountability to entities in the external environment that exert power and authority on the utility, are critical success factors for institutional performance. Table 3 summarises various items assessed under each dimension. The factors that contribute to the degree of effective autonomy of the water utility include (i) legal authority of the utility; (ii) the policy framework; (iii) political commitment and support; (iv) availability and quality of natural resources; (v) the regulatory framework; (vi) conditions of the labour market; and access to financial resources. In the same vein, external stakeholders play an important role in enhancing the utility's external accountability, through functions such as (i) policy making; (ii) monitoring the performance as owners of the utility; (iii) regulating the utility in terms of compliance with legal/contractual obligations and service standards; (iv) demanding for an appropriate level of service quality by the customers; and (v) conforming to appropriate preconditions for external financing. To assess the institutional capacity of a public water utility, an analytical framework was developed, which assessed three key dimensions of (i) the utility and its environment; (ii) internal functioning of the utility; and (iii) its performance.

Table 3: Framework for assessing the institutional capacity of a public water utility (Source: Baietti et al [39])

Dimensions	Sub-dimensions	Scope
The utility and its environment	Establishing degree of autonomy	• Policy formulation • Regulation • The legal authority of the utility • Other external limitations
	Performance targets	Performance targets with respect to effectiveness and efficiency of service provision
	Accountability for results	• To government, the owner • To the regulator • To the financial institutions • To customer organisations • To non-governmental interest groups
Internal functioning of the utility	Organizational structure, corporate objectives and financial/investment resources	History of the utility, departmentalisation, chain of command, span of control, formalisation, strategic orientation and corporate planning, level of self-funding
	New Public Management (NPM) core criteria	• Market orientation • Customer orientation • Decentralisation of responsibilities with respect to o Financial management o Operations management o Human resource management o Customer relations management • Accountability for results: o Between owner and management oversight agency o Between management oversight agency and service provider o Within the service provider

Dimensions	Sub-dimensions	Scope
		(managerial accountability)
Performance	Financial performance	• General financial indicators, such as related to costs of service provision • Efficiency indicators • Leverage indicators • Liquidity indicators • Profitability indicators
	Operational indicators	• Water consumption indicators • Water distribution system indicators • Water losses • Waste water indicators
	Human resource management indicators	• Labour productivity • Training /capacity building indicators • Staff satisfaction surveys
	Customer care management indicators	• Customer satisfaction indicators • Perceived service quality • Spend on customer care management

National Urban Water Governance Program, Monash University, USA (2007)

Table 4: Capacity attributes for sustainable urban water management (Source: van de Meene and Brown [40])

Dimensions	Sub-dimensions
1. External rules and incentives	• There is senior management commitment (political leadership) to SUWM involving vision, appropriate legislation and policies, financial and technical support • There are established and effective community participation mechanisms • Legislation is holistic and provides a supportive framework for SUWM • Clear roles and responsibilities are defined for all organizations • Regulations and policy tools encourage SUWM
2. Inter-organizational	• Collaborative arrangements with central and local governments are present • Mechanisms for effective coordination and cooperation between vertical and horizontal organizations exist • Mechanisms for clear and effective communication are in place • Urban water related information is shared and communicated between vertical and horizontal organizations • Research partnerships with local universities are developed
3. Intra-organizational	• Organization employs staff, or has access to staff, to undertake technical activities or that understand and can use technical information • Organization provides training to all staff • Organization has policies and procedures to attract, develop and retain staff • Organization is competent in financial management • Organization has adequate scientific and technical knowledge • Organization encourages innovation
4. Human Resources	• Staff have skills and knowledge to undertake tasks and can understand and make use of relevant information • Staff have appropriate qualifications to undertake tasks • Staff can think laterally and exhibit innovation • Staff demonstrate leadership • Staff are aware of available opportunities

There are increasing external pressures in urban areas such as impacts of climate change, amidst escalating urban populations, which require adoption of sustainable urban water management (SUWM) practices. Low institutional capacity has been identified as the most significant barrier to SUWM [40, 41]. As part of a contribution to addressing this gap, S. van de Meene and R. Brown of Monash University carried out a cross-disciplinary literature meta-analysis to develop an empirically-based schema of the necessary capacity attributes for SUWM. They defined institutional capacity as the ability of the whole institution, i.e. from individuals through to organisations, and the legislation and policy instruments used (i.e. role- and rule-based definitions of institutions), to undertake a task, in this case SUWM. Table 4 shows a summary of the capacity attributes synthesized across the findings from five disciplinary areas of water resources management, natural resource management, urban planning and management, technology innovation and development, and community development.

Japanese International Development Agency (JICA), (2008)

JICA defined institutional capacity development as 'the ongoing process of enhancing the problem-solving abilities of developing countries by taking into account all the factors at the individual, organisational and society levels' [42, p.184]. Based on this definition and further JICA-commissioned research, Yoichiro Kimata, a researcher at JICA's Institute for International Cooperation developed a map of basic characteristics to be assessed. Kimata [42] differentiated between organisational capacities and the enabling environment, and emphasizes that addressing only the former is insufficient.

Organisational capacities are subdivided into two categories: technical and core capacities. Examples of technical capacities are knowledge, skills, techniques, including tacit knowledge that has accumulated within the organisation. Core capacity is the ability of the organisation to solve its problems on its own by managing the technical capacity: this includes the will/commitment, leadership, and management methods that orient the behaviour of individuals and their organisation. Additionally, there are factors in the enabling environment that need to be addressed. These include the social/cultural, policy and institutional framework that determine the organisation's capacity and assets (such as the budget, infrastructure, and natural resources). The author points out that whereas technical capacities show linear changes in rather a short period of time, and are therefore easily noticeable, core capacities, which support the development of technical capacities take a long time to develop, mainly because they need to take into consideration the likes, dislikes, perceptions, mind-sets and behaviours of the stakeholders.

Summary on existing evaluation tools

Institutional sustainability has been evaluated in various ways, depending on the conceptual framework being applied. The reviewed literature provides evaluation tools developed by international development partners and researchers. Three of the reviewed tools are specifically tailored for evaluating water service providers, two of them tailored for application to urban water utilities in developing countries. One of these tools (i.e. developed by van de Meene and Brown, [40]) is tailored for evaluating sustainable urban water management (with emphasis on storm water drainage) in any country, including industrialised countries. The rest of the reviewed tools, which were developed by international development agencies are generic, and can be applied to public sector organisations in developing countries. Most of the evaluation tools reviewed have conceptualised institutions as both the rules and roles, and therefore consider factors in both the external and internal environments of the organisation. It is interesting to note that four of the tools presented above consider organisational performance as one the attributes contributing to institutional sustainability. This conforms to a school of thought advanced by some recent scholars (e.g. Baser et al [43] and Wigboldus et al [44]) that given the right conditions in the operating environment (both external and internal), improved organisational performance will lead to improved institutional capacity, and vice versa. Most of the presented tools do provide fairly detailed measurement instruments, in form of checklists or multiple-scale questions/statements with Likert scale responses. The next sub-section briefly describes and discusses empirical evidence reported in extant literature, on the relationships between Total Quality Management, ISO Quality Management Systems and Institutional Capacity.

Link between ISO 9001 Quality Management Systems and Institutional Capacity: Literature Review

What is Total Quality Management and its accompanying Quality Management Systems?

The concept of Total Quality Management (TQM) emerged around 1980, primarily amongst manufacturing firms in USA, in response to global competition, mainly from Japanese organisations. Its use has since filtered through to all sectors, including the public sector [45]. TQM has been defined differently by various scholars. A commonly cited definition in the literature is one where TQM is presented as 'an on-going process whereby top management takes whatever steps necessary to enable everyone in the organization in the course of performing all duties to establish and achieve standards which meet or exceed the needs and expectations of their customers, both external and

internal' [46, p.157]. To effectively implement TQM, an organisation needs a management system that will ensure that external and internal customers consistently receive quality, i.e. the Quality Management System (QMS). A QMS is composed of the management structure, responsibilities, procedures, mechanisms, processes, and management resources to implement the principles and action lines needed to achieve the quality objectives of an organisation, which strives for continuous improvement in performance. This conceptualisation of a QMS aligns well with the definition adopted in this paper of Institutional Capacity, i.e. 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. The rest of this section analyses documented studies on the linkages between implementation of QMS and improved institutional capacity, and, by extension, organisational performance.

TQM and implementation of QMS have been favourable topics in academic and practitioners' journals dealing with business management and other sectors seeking to mainstream management skills for better performance. Many scholars have attempted to identify critical factors of TQM. For instance, Easton and Jarrel [45] came up with the following list of key characteristics:

- Process focus – emphasis on concept of process as a fundamental building block of the organization;
- Systematic improvement – widespread organizational focus on quality improvement, cycle-time reduction, and waste reduction, as well as adoption of a prevention-based orientation;
- Organization-wide emphasis of the process concept and systematic improvement;
- Customer focus, including (i) emphasis on customer requirements and customer satisfaction to define product and service quality; (ii) emphasis on customer service; (iii) integration of customer information into the management and improvement systems; and (iv) efforts to become integrated with customers as appropriate;
- Management-by-fact – emphasis on deployment of systematic analysis and fact-based decision making driven by objective data and information;
- Employee involvement in improvement, usually through teams, with an emphasis on development through training; moving decision making close to the process; and empowering the employees;
- Cross-functional management – explicit emphasis on aspects such as cross-functional involvement in key process (e.g. product development) and cross-functional improvement;
- Managing supplier relationship and performance - such as emphasis on supplier quality, service performance, supplier capabilities, supplier improvement, supplier involvement and integration; and
- Recognition of TQM as a critical competitive strategy – and making it a primary concern of all levels of management, with senior management providing leadership for development and deployment of quality management.

Table 5 summarizes key characteristics of TQM as elicited by a sample of TQM scholars. As can be seen in the table, there is significant overlap and similarities among the characteristics advanced by various scholars. From this sample of authors, the top seven characteristics considered important are top management leadership and commitment; staff involvement and management; customer focus and involvement in TQM; supplier relations to ensure supply quality management; staff training, development and empowerment; process management and measurement systems for its improvement; and managing by facts and internal quality information usage. Characteristics considered important by few scholars are the role of a quality department; managing external interface; use of Just-In-Time (JIT) principles; flexible manufacturing; and having an open organisation. These characteristics may be categorised as institutional TQM (or soft TQM) and technical TQM (or hard TQM) [50, 53, 54]. The hard TQM elements are marked with a star in Table 5. As can be seen, compared to the technical TQM components, institutional TQM characteristics are considered to be more important by most scholars quoted in Table 5, which coincides with the proposition by various scholars that low institutional capacity is the most significant barrier to sustainable urban water management [40, 41].

There has been some debate on the extent to which implementation of QMSs lead to improved organisational performance. In general, there is a consensus amongst most scholars that TQM is an effective management philosophy that provides organisations with stability, growth and prosperity, which in turn leads to improved performance. Table 6 shows a summary of findings from various studies that support this proposition. Findings summarised in the table show that various types of organisations in differing contexts that have implemented TQM have registered improvements in organisational performance, notwithstanding the fact that various case studies have operationalised organisational performance differently – either at operational level (e.g. supplier quality management, process management or product/service design), or in terms of corporate performance (e.g. financial & market performance, employee satisfaction, customer satisfaction). There are also differences in the way TQM has been conceptualised and operationalised: either as separate dimensions or as a combined construct.

Table 5: Key characteristics of TQM as elicited by a sample of scholars as reported in the literature

Author / Characteristics	Saraph et al [47]	Flynn et al [48]	Waldman [49]	Powell [50]	Ahire et al [51]	Black & Porter [52]	Dow et al [53]	Rahman [54]	Freq.
Top management leadership/commitment	x	x	x	x	x		x	x	**7**
Supplier involvement/ performance; Supply quality management	x	x	x	x	x	x	x		**7**
Staff involvement /management	x		x	x		x	x	x	**7**
Customer relationship /involvement/focus		x	x	x	x	x	x	x	**7**
Staff Training & Dev.	x	x		x	x		x	x	6
Process improvement /management; measurement systems	x	x		x		x		x	5
Internal quality information usage, managing by facts	x	x	x		x			x	5
Product/service design*	x	x		x	x				4
Benchmarking		x		x	x		x		4
Staff empowerment		x	x		x			x	4
Strategic quality management, shared vision			x			x	x	x	4
Adoption & communication of TQM			x	x		x			3
Use of Statistical Process Control*					x	x			2
Teamwork structures					x		x		2
Development of a corporate quality culture			x			x			2
Open organization				x					1
Flexible manufacturing*				x					1
Use of JIT principles*							x		1
External interface management						x			1
Role of quality dept.	x								1

* Characteristics classified as technical (hard) TQM dimensions

In all the articles summarised in Table 6, TQM was found to be strongly correlated, *but not causally linked*, to organisational performance. Some scholars (e.g. Powell [50]; Rahman [54]; Dean and Bowen [62]) contend that not all characteristics of TQM contribute to organisational performance: they point out that the more prominent TQM elements are comprised of the basic human resources management aspects, which are extensively discussed in the literature as essential for organisational management, outside of the TQM paradigm. In this respect, Powell [50] stated that organisations that acquire these basic management skills can outperform competitors without necessarily implementing the TQM concept. Other critics have claimed that implementation of TQM may even result into deterioration in performance, mainly because TQM practices may hinder innovation (e.g. Brah et al, [60], Harari, [63] and Samaha, [64]). The critics cite customer focus as one of the obstacles to innovation, as its application could trap organisations into captive markets dominated by existing customers [65]. The proponents of TQM's significant contribution to organisational performance have countered the negative arguments by pointing out that these

observations are based on studies with flawed methodologies - they are not based on robust empirical research that determines the impact of TQM on corporate performance; rather, they usually focus on related events, such as winning quality awards, or achieving ISO certification [45], [61].

Table 6: Results of selected empirical studies on the positive effect of TQM practices on organisational performance

Author(s)	Research objectives & study setting	Summary of key findings
Pinho [55]	Empirical assessment of how developing a quality management approach can affect financial performance of SMEs in Portugal. 134 SMEs responded to a cross-sectional survey – 55 of which were implementing TQM.	TQM is one of the major contributors of organizational performance. The other key contribute is the propensity to innovativeness of the organization.
Prajogo, and Hong, [56]	An empirical investigation of the effect of implementation of TQM practices on the performance Research &Development Divisions of S. Korean manufacturing firms – Data was collected from 130 firms	There is a strong and highly significant relationship between TQM practices and product quality, and product innovation, respectively.
Joiner, T.A. [57]	Empirical investigation of the relationship between level of implantation of TQM practices with organizational performance of 80 motor vehicle parts manufacturers in Melbourne, Australia	The degree of implementation of TQM practices was significantly positively related to organizational performance, and an environment of support within the organization produces a synergetic effect on the TQM/performance relationship
Ou, Liu, Hung, and Yen, [58]	Empirical examination of the impact of seven dimensions of TQM on business performance of 95 information-related industries in Taiwan in 2005	The implementation of TQM activities is strongly correlated to improvement in operational performance, which is in turn is strongly related to customer satisfaction and financial performance
Kaynak [59]	An empirical study of relationships between eight dimensions of TQM, and more specifically, how product design, inventory management performance and process management impacts on quality performance, which in turn impacts on financial and market performance. Data was obtained from top managers of 382 firms in the USA.	All TQM dimensions contribute indirectly or directly to firm performance, through the mediating variables of operational performance (i.e. inventory management and quality management). Those that contribute directly to operating performance are supplier quality management, product/service design, and process management. The positive effect of TQM practices on financial and market performance is mediated through operating performance.
Brah et al [60]	Empirical study on the effect of implementing TQM in manufacturing & service companies in Singapore on organizational performance. Questionnaires were sent to 55 non-TQM and 130 TQM-implementing companies	All TQM-implementing companies outperformed the non-TQM companies in all performance dimensions of supplier performance, employee service quality, product quality, employee satisfaction, customer satisfaction and manufacturing/service process quality. The difference was very highly significant.
Hendricks & Shinghal, [61]	Empirical study on the effect of TQM implementation on the financial performance of 600 award winning firms in the USA, by looking at performance trends in periods during and after implementation of TQM practices	During the post-implementation period, firms that implemented TQM outperformed the carefully selected benchmark firms in the industry, in terms of stock price, sales growth, profit and return on sales and assets employed; There was no significant difference between the two sets of firms during the implementation period
Easton, G.S. and Jarrel, S.E. [45]	Examine impact of TQM on performance of 108 firms in the US that implemented TQM during 1981-1991	Performance, measured by accounting variables and stock returns is improved for firms implementing TQM, and the improvement is consistently stronger for firms at advanced stages of implementation.

What are ISO 9000 Series of Quality Management Systems?

ISO (i.e. International Organisation for Standardization, in full) is the world's largest developer and publisher of International Standards. ISO, which has been operational since 1947, is a network of national standard institutes of 160 countries, with its headquarters in Geneva, Switzerland. Most of the standards developed by ISO are highly specific. ISO developed two generic standards that are relevant to water supply service providers, the ISO 9000 and ISO 14000 family of standards. By definition, general standards can be applied to any type of organisation, whether large or small, whatever its output - products or services, whether it is government, private or NGO sector. Whereas

ISO 9000 is primarily concerned with quality management, ISO 14000 deals with environmental management. Both ISO 9000 and ISO 14000 are concerned with processes, i.e. the way an organisation goes about its work, but not directly concerned with products, i.e. the result of their work, although management of processes will ultimately affect the products. The two generic standards also require organisations that implement them to improve their performance continually. These two families of standards have achieved a global status and are now thoroughly integrated with the world's economy [66].

The ISO 9000 family of standards first emerged in 1987, and its implementation is expected to lead the organisation to (i) fulfilling customer quality requirements; (ii) fulfilling applicable regulatory requirements; and (iii) achieving continual improvement of its performance in pursuit of these objectives. At the time of the study, over a million organisations in 176 countries were reportedly implementing ISO 9000 family of standards. The ISO 9000 series of standards is based on the concept that management systems are generic, regardless of what an organisation is or what it does. Whereas traditional quality standards rely on inspection of products to ensure quality, the ISO 9000 standards relies on the control and continuous improvement of processes used to define, design, produce, evaluate and deliver the products/services: they are process-based rather than results oriented standards, and certify that an organisation has implemented a quality system that is capable of consistently producing quality products/services that satisfy customers' expectations. The ISO 9000 series of standards are designed to provide general guidance on the development of a successful quality system that will deliver quality services and products that satisfy customers' expectations [67].

To maintain effectiveness and relevance, the ISO 9000 family of standards and guidelines are periodically reviewed, based on factors in the ever-changing global environment with respect to quality management. Hence, the ISO website shows various modules of ISO 9000 series of standards that have been updated at different times since the early 1990s. The main document in the series is the 'ISO 9001:2008 Quality Management Systems – Requirements', which provides guidance for an organisation seeking to establish a QMS, and is the standard in ISO 9000 family against whose requirements the organisation's quality management system can be certified by an external body. It is the only document that specifies mandatory requirements, in terms of components of the quality management system; the management responsibilities; resource management - including human resources and suppliers; product realisation; and measuring, analysis and measurement. Other main documents that support ISO 9001 are ISO 9000 on fundamentals and vocabulary; and ISO 9004, a guideline for an organisation's continual performance improvement, as well as for extending the benefits from ISO 9001 to all parties that are interested in or affected by the organisations operations [66].

ISO 9000 places the responsibility for the establishment, performance and maintenance of the quality management system on the organisation's top management, who are required to lead the organisation towards improved performance, by implementing eight identified quality management principles that form the foundation for the ISO 9000 family of standards. These are [66, 68]:

i. Customer focus - the organisation should understand current and future customer needs, meet customers' requirements and strive to exceed customer expectations;
ii. Leadership – top management should establish unity of purpose and direction of the organisation, and create /maintain the internal environment in which staff can become fully involved in achieving the organisation's objectives;
iii. Involvement of people – staff at all levels are the essence of an organisation and their involvement enable their abilities to be used for the organisation's benefit;
iv. Process approach – activities and related resources should be managed as a process in order to achieve a desired result more efficiently;
v. System approach to management - identifying, understanding and managing interrelated processes as a system contributes to the organisation's effectiveness and efficiency in achieving its objectives;
vi. Continual improvement – the organisation should aim for continuous improvement of overall performance at all times;
vii. Factual approach to decision making – Decisions should be based evaluation of analysed data and information; and
viii. Mutually beneficial supplier relationships – the organisation should work for mutually beneficial relationship with suppliers and other partners so as to enhance the ability of both parties to create value.

The principles listed above are not elements against which an organisation may be assessed. They should be considered to represent the underlying philosophy of ISO 9000 family of standards, to be used as building blocks for

a corporate quality policy, which top management should define and communicate, and make it the basis of defining the roles and responsibilities of those involved in quality management. It should be noted that external certification is not a compulsory requirement for ISO 9000 series of standards. Instead, the standard requires the organisation to audit itself against ISO 9001 standards, in order to verify that it is managing its processes effectively. The organisation may invite its clients to audit the quality management system in order to give them confidence that the organisation has capacity to deliver products/services that meet their expectations. An organisation may engage the services of an independent system certification body or consultant to obtain an ISO 9001 certificate of conformity, an option that has gained popularity because of the perceived credibility of independent assessment. However, ISO does not monitor the activities of ISO 9000 accreditation bodies – this is done by accreditation boards within the member countries. The overarching role of ISO is to disseminate information on systems quality, and enables a consensus to be reached on solutions that meet both the requirements of business and the broader needs of society [68].

ISO 9000 has developed a self-assessment tool that assists an organisation to determine its maturity levels for sustained success, identify opportunities for improvements and innovations, set priorities for improvements, and establish action plans. A mature organization is one that performs effectively and efficiently, and achieves sustained success. The degree, or level, of an organization's "maturity" describes its position on a scale that has immature, inconsistent organizational activities at the lower end (Scale 1), to mature, consistent organizational activities at the higher end (Scale 5). An organization's maturity will be determined by its performance in relation to its vision, mission and strategy; systems, organizational structures and tools used; and relations with interested parties. Organisations that achieve ISO 9001 certification are anticipated to have progressed beyond a basic level (Scale 1) to being proactive, at Scale 2 of level of maturity. After ISO 9001 certification, an organisation is expected to grow to Scale 3 (i.e. being proactive and flexible), then Scale 4 (being proactive, flexible and progressive) and ultimately to Scale 5, which signifies an organisation that has achieved sustainable success [68].

What are the benefits of implementing ISO 9000 QMSs and ISO 9001 certification?

It is expected that most new users of the ISO 9000 family of standards will obtain measurable benefits early in the process of implementing the prescribed requirements [68]. Table 7 shows key benefits that ISO expects to result from implementing actions that contribute to the eight ISO 9000 series quality management principles. A few studies published in the public domain report a strong and positive relationship between ISO 9000 certification and organisational performance, as anticipated by ISO. Examples are a study conducted with US- and foreign-owned firms in the USA [69]; a survey of over 1000 certified companies (including 415 service firms) in the UK [70]; a survey of ISO-certified firms in Taiwan [71]; a study comprising of ISO-certified and non-ISO-certified of firms in India [72]; an assessment of Spanish ISO-certified firms [73]; and a study of 11 European firms [74]. Also, empirical studies such as reported by Ho [75] Sun [76] and Singel et al [77] have confirmed the realisation of some of the benefits listed in Table 7.

In another study conducted in Spain, Santos and Escanciano [78] confirmed most of the benefits predicted by ISO, which were classified into four groups, using factor analysis: collective commitment and process improvement (i.e. increased employee motivation and satisfaction, better relations between management and staff, improved work environment, better training for staff, better understanding of process and internal customer orientation); competitive position in the market (i.e. increasing growth of sales, improving market share; gaining new customers, increased customer loyalty); efficiency (i.e. costs reduction, improved profitability, increased profitability, greater advantage of time and resources, reduction in incidents, rejections and complaints); and attraction and external orientation (i.e. improvement of firm image; improved product/service quality, improved customer satisfaction, and better knowledge of customers' expectations).

Scholars have differentiated between implementation of ISO 9000 QMSs and ISO 9001 certification. A number of studies have shown that certification to ISO 9000 does not necessarily lead to increased organisational performance. Examples are the study in Australia and New Zealand reported by Terziovski et al [79], which found that ISO 9001 certification had little or no impact on organisational performance; a review by Dick [80] that found no consistent association between ISO 9000 certification and acquisition of a quality management system that delivers better quality; a study by Singels et al [77] in Netherlands, which did not find a positive relationship between ISO certification and organisational performance; and a more recent study conducted in Spain by Martinez-Costa et al [81], which found that there were no significant differences in performance between ISO- certified and non-certified firms. Hence, whereas there is a general agreement among scholars regarding the positive impact of TQM on organisational performance, the same cannot be stated for certification to ISO 9000 series of standards and guidelines.

Table 7: Key perceived benefits from implementing ISO 9000 Quality management principles (Source: ISO [68]).

Quality Management Principle	Key Perceived Benefits
1. Customer focus	• Increased revenue and market share obtained through flexible and fast responses to market opportunities. • Increased effectiveness in the use of the organization's resources to enhance customer satisfaction. • Improved customer loyalty leading to repeat business.
2. Leadership	• People will understand and be motivated towards the organization's goals and objectives. • Activities are evaluated, aligned and implemented in a unified way. • Miscommunication between levels of an organization will be minimized.
3. Involvement of people	• Motivated, committed and involved people within the organization. • Innovation and creativity in furthering the organization's objectives. • People being accountable for their own performance. • People eager to participate in and contribute to continual improvement.
4. Process approach	• Lower costs and shorter cycle times through effective use of resources. • Improved, consistent and predictable results. • Focused and prioritized improvement opportunities.
5. Systems approach to management	• Integration and alignment of the processes that will best achieve the desired results. • Ability to focus effort on the key processes. • Providing confidence to interested parties as to the consistency, effectiveness and efficiency of the organization.
6. Continual improvement	• Performance advantage through improved organizational capabilities. • Alignment of improvement activities at all levels to an organization's strategic intent. • Flexibility to react quickly to opportunities.
7. Factual approach to decision-making	• Informed decisions. • An increased ability to demonstrate the effectiveness of past decisions through reference to factual records. • Increased ability to review, challenge and change opinions and decisions.
8. Mutually beneficial supplier relations	• Increased ability to create value for both parties. • Flexibility and speed of joint responses to changing market or customer needs and expectations. • Optimization of costs and resources.

Much of the accumulated literature on ISO 9000 series of standards is informed by experience of the manufacturing industry, which accounts for a lion's share of the ISO 9000-certified organisations. There has been debate amongst TQM scholars as to whether, given their manufacturing-centric nature, ISO 9000 series of standards is suited to the public service sector [82]. Several empirical studies have shown that ISO 9000 series of standards have the potential to make the public services organisations operationally more efficient, leading to better organisational performance. One of the well documented examples of success in the public sector is the case of the Australian Maritime Safety Authority (AMSA), a self-funded national safety agency created by an Act of Parliament, which reported achievement of the high levels of operational standards for the safe operation of ships in Australian waters [83]. Another study surveyed 103 ISO 9001-certified Mexican public sector institutions over a period of 14 months to find out to what extent ISO 9000 QMS had affected institutional effectiveness [84]. Most organisations (77%) achieved significant improvements in delivery time; productivity and customer satisfaction; and a reduction in defects and customer complaints. About 10% of the organisations did not experience a significant change in performance improvement, while 5% registered a decrease in performance.

What are the shortcomings of implementing ISO 9000 QMSs and ISO 9001 certification?

As discussed above, there is a lack of consensus amongst scholars and practitioners on whether certification and implementation of ISO 9000 significantly and positively influences organisational performance. Several scholars have endeavoured to account for these anomalies. For instance, Singels et al [77] explained that ISO 9001 certification is not a standardised package that can be applied in the same way in every firm – ISO 9000 standards only recommend the essential elements of a quality management system, without recommending ways of applying them. Hence, this results into each organisation designing its own system that fits its specific needs within the framework of the requirements of ISO 9000 standards. Naveh and Marcus [85] also concur with the position that the ISO 9000's lack of unanimity in making a positive impact on organisational performance may be explained by the various ways organisations implement the generic ISO 9000 standards.

Other scholars have attributed the unclear and sometimes contradictory performance-related consequences of ISO 9001 certification to application of early versions of ISO 9000 family of standards, which lacked coherence between the critical building blocks for TQM. For instance the old ISO 9000/1994 listed 20 individual elements that described categories ranging from management responsibility to statistical techniques, but were not linked to each other. On the other hand, the newer ISO 9000/2000 version has four major sections that are logically linked to each other [81, 86, 87]. In fact, an empirical study conducted with 713 manufacturing firms in Spain showed that companies certified under the 2000 version of ISO 9000 standards performed better in aspects of unit product costs, design quality and customer satisfaction, compared to those certified under the 1994 version of the ISO 9000 standards [81].

There are other specific shortcomings of ISO 9000 family of standards that have been cited in the literature. For example, Allen & Aakland [88] and Santos & Escanciano [78] describe the following key limitations: (i) ISO 9001 certification merely ensures that the product is obtained in a consistent, repeatable manner, but not that it is of high quality, or attractive to the customer (ii) ISO 9000 has limitations in such important subjects such as customer's satisfaction, the firm's economic results, continuous improvement and quality management training (these limitations are specific to the 1994 version of ISO 9000, and have largely been addressed by new versions, as explained in the previous paragraph) ; and (iii) the system for ISO 9000 produces an increase in the organisation's paperwork and bureaucracy, which is not only a potential source of rigidity, but leads to higher costs.

One of the most important shortcomings of ISO 9000 family of standards commonly discussed in the literature is related to the motivation for gaining the ISO 9001 certification. Some authors have pointed out that firms may undergo the certification process with the desire of simply attaining the title and the image that comes with it, sometimes in reaction to the market pressures [78]. This aspiration makes business sense, give that some regional organisations such as the European Union recommend or demand possession of ISO 9001 certification, or equivalent for commercialisation of products in the member states [76, 78]. For instance, an empirical study of 1,000 firms in Australia and New Zealand found that ISO 9001 certification did not have a significant influence on organisational performance, and that for most firms the motivation for pursuing ISO certification was the ability of the certificate to open customers' doors that were previously closed, or would close, if the ISO 9001 certification were not achieved [79, 80].

A number of empirical studies [76, 77, 89, 90, 91] support the findings reported in the previous paragraph and have shown that if organisations cited external pressure as the main reason for pursuing ISO 9001 certification, they were less likely to achieve improvements in the organisational performance. Dick [80, p.369] found '…some evidence that ISO 9001 certification can be achieved too easily by those who just want the badge.' Such firms, who obtain certification reacting to external pressure, adopt a minimalist approach to achieving it, and may not value the quality assurance system that is meant to be the foundation for the certification. Organisations that view ISO 9000 standards as a vehicle for genuine process improvements have a greater chance of success, as the standards are designed precisely for this purpose [83]. Similarly, the study conducted with the Mexican public service sector found that those government institutions that implemented ISO 9000 standard for improving welfare of society performed much better than those agencies which had politically/externally-driven motivations [84].

A danger for ISO 9001 certification, therefore, is that an organisation may regard ISO 9001 certification as an end in itself, and does not progress to full implementation of TQM. If ISO 9001 certification is only for the purpose of getting a certificate and for advertisement purposes, the documents and procedures will destroy the normal business process and may not contribute to improvement of performance [76]. The organisational performance will be improved only when an organisation is internally motivated for improvement of its organisational processes [78]. For an organisation to develop institutional capacity that enables it to perform on a sustainable basis, it should

systematically integrate ISO 9000 procedures with the philosophy, human resource development and strategic management prescribed by the TQM philosophy, and advance to implementing TQM to the full.

Can ISO 9000 QMS offer a sound framework for evaluating Institutional Capacity?

In this section we report on findings of a qualitative content analysis carried out to match the themes of institutional capacity derived from the reviewed evaluation tools/guidelines and presented in the previous section, with the institutional aspects promoted in the ISO 9000 series of standards. After reviewing the relevant ISO 9000 QMS documents, we applied the analytic decomposition method proposed by Saleth and Dinah [92] to inductively develop ten institutional aspects for conforming to ISO 9000 series of standards, and then matched them to the dimensions used by various tools/guidelines for evaluating institutional capacity, which are described in the previous section. Ten institutional aspects were identified from the ISO 9000 series of standards, as follows:

1. Strategy/policy formulation & planning (SP&P)
2. Strategic Leadership (SL)
3. Customer Focus (CF)
4. Establishment, implementation & maintenance of quality management systems (QMS)
5. Management of Human Resources (MHR)
6. Management of other key resources (MOKR)
7. Information, Knowledge Management & Communication (IKMC)
8. Process and System Management (PSM)
9. Monitoring, measuring, analysis and review (MMAR)
10. Improvement, innovation and learning (IIL)

The output of the matching exercise is shown in Table 8.

Table 8: Matches between key dimensions of various measurement instruments of Institutional Sustainability and institutional aspects of ISO 9000 standards

Author	Key dimensions of Institutional Sustainability	Matching ISO9000 Institutional Aspect(s)
1. Water and Sanitation for Health Project, USAID (1988)	Organizational autonomy	Not explicitly covered
	Leadership	SL
	Management and administration	MHR, PSM, IKMC, MOKR
	Commercial orientation	MOKR
	Consumer orientation	CF
	Technical capacity	MHR, MOKR, QMS, PSM, IIL
	Development and maintaining staff	MHR, SL, MMAR
	Organizational culture	SL, MHR
	Interactions with key external staff	MOKR
2. International Development Research Centre, Canada (1995)	Key forces in the external environment	Not explicitly covered
	Organizational motivation	SP&P, SL, CF
	Organizational capacity	SP&P, SL, QMS, MHR, MOKR, IKMC, PSM, MMAR
	Organizational performance in terms of effectiveness, efficiency, and relevance.	These are outcomes
3. Norwegian Development Cooperation (NORAD), 2000.	Organizational strategy - purpose, goals and strategy	SP&P, CF
	Organizational management: capability of executive bodies; systems and procedures; organizational structure;	SL, HRM, PSM,
	Financial resources and economic independence	MOKR
	Infrastructure: technical infrastructure; administrative equipment	MOKR
	Performance: performance & productivity; performance demands and control;	SL, HRM,
	Institutional competence	HRM
	Personnel: technical personnel; managerial and administrative personnel; personnel policies, incentives and compensation	HRM

Author	Key dimensions of Institutional Sustainability	Matching ISO9000 Institutional Aspect(s)
	Culture, communication, cooperation and authority	IKMC, SL
	Linkages/Networks: alliances and connections; competitors and rivals; relations to donors	MOKR,
	Legal and political framework: legal basis and constraints; political support	Not explicitly covered
	External cultural framework: community rules and norms; rules and norms in official agencies	Not explicitly covered
	Participation and legitimacy: local ownership and participation; legitimacy and trust in community	MOKR
4.UK Department for International Development (DFID), (2003)	Strategic and institutional environment	Not explicitly covered
	Strategy	SP&P, SL
	People/HRM	HRM
	Structure	HRM, PSM
	Inputs and resources	MOKR
	National culture	Not explicitly covered
	Systems	PSM
	Output/performance	These are defined as outcomes
5. European Commission, 2005	Leadership	SL
	Strategy	SP&P
	Structures	MHR, QMS
	Internal relationships	SL, MHR, IKMC,
	Helpful mechanisms - coordinating and control instruments	MOKR, MMAR
	Rewards	MHR, SL
6. The World Bank, 2006	Establishing degree of autonomy	Not explicitly covered
	Performance targets	MMAR, SP&P
	Accountability for results	MMAR, MHR, CF, IKMC
	Organizational structure, corporate objectives and financial/investment resources	SP&P, MHR, MOKR,
	New Public Management (NPM) core criteria	MOKR
	Financial performance	MOKR
	Operational indicators	MMAR, IIL
	Human resource management indicators	MHR
	Customer care management indicators	CF
7. van de Meene and Brown (2007)	External rules and incentives	Not explicitly covered
	Inter-organizational aspects	MOKR
	Intra-organizational aspects	IKMC, PSM,
	Human resources	MHR
8. Japanese International Development Agency (JICA), (2008)	Core capacity: will, commitment, awareness, the form of organization that makes optimal use of its assets, management methods, leadership.	SL, SP&P, HRM, MOKR, PSM,
	Technical capacity: knowledge, techniques, skills	MOKR, HRM, IIL
	Enabling environment: Formal and informal institutions, social capital, social infrastructure, physical and human assets	Not explicitly covered

Table 8 shows that ISO 9000 series of standards deals with all aspects of IS related to (internal) organisational capacity. However, aspects of IS relating to the external environment have not been explicitly covered by ISO 9000 series of standards. These have been categorised by various authors as (i) some factors impacting on organisational autonomy; (ii) key factors in the external environment; (iii) legal and political framework; (iv) some factors affecting participation and legitimacy in the wider community; (v) strategic and institutional environment; (vi) national culture; (vii) helpful mechanisms in the external environment; (vii) external rules and incentives; (ix) enabling environment; (x) changes in the external environment; and (xi) compliance ability in the external environment. Also, organisational performance indicators do not feature under ISO 9001 certification, as the

standards are generic and process-based. However, performance has featured in half of the tools/guidelines presented in Table 8.

Link between ISO 9000 QMS and Institutional Capacity: case studies in Sub-Saharan Africa

We used various methods listed in Table 1 to collect primary and secondary data from two urban water utilities in sub-Saharan Africa to (i) examine the extent to which senior and middle-level management in the case study water utilities actively use the ISO 9000 quality management framework to guide the utility towards improved performance; and (ii) obtain the perceptions of management and staff of the utility on the added benefits derived from being ISO 9001 certified and using the quality management framework to improve performance. As stated in the 'Methods' section, we shall not disclose the identities of these water utilities, in order to conform to ethical requirements, and shall refer to them as Utilities A and B.

Background information on the case study utilities

Both Utilities A and B are acclaimed as among the best-in-class water utilities in sub-Saharan Africa. While Utility A operates under the public management model, Utility B is managed by an international water operator, under a delegated management model. Box 1 shows comparative 'headline' characteristics of the two water utilities nearer the time of the study. There are similarities and differences in the institutional setup, organisation capacity and the ISO 9001 certification process undergone by the two case studies. Considering the scope of service delivery, both water utilities provide services to urban centres (major cities and small towns) of their respective countries. Whereas Utility A also provides sewerage services, Utility B's mandate is restricted to only water services. However, the scope of ISO 9000 certification was limited to only water services in both case studies. As can be seen in Box 1, the two water utilities received the first ISO certification about the same period of time – certification was for all operational units in Utility B, whereas Utility A started the ISO 9001 certification journey with two service areas.

Box 1: Comparative data showing service scope of the two case study utilities (2010)

Utility A	
Number of urban areas served	- 23
Population served	- 2,950,000
Number of water connections	-246,500
Number of sewerage connections	- 15,600
No. of employees	- 1,589
Date of first ISO 9000 certification*	- 2003

Utility B	
Number of urban areas served	- 56
Target Population	- 5,000,000
Number of connections	- 520,000
No. of employees	- 1,138
Date of first ISO 9000 certification	- 2002

*This date refers to when the first two of the 23 service towns of Utility A received ISO 9000 certification

Both water utilities enjoy a reasonable level of external autonomy. Salaries for their staff are set by their respective Boards of Directors. Both utilities rely on their governments to source investment financing from international financing institutions (IFIs). Water tariffs for both utilities are approved by government, and are indexed according to a nominal annual inflation rate. Although both water utilities may put forward proposals that are consistent with their revenue requirements, Utility A, compared to Utility B has got more leeway in causing tariff reviews. Both utilities use external auditors to audit their financial statements. Both water utilities operate within performance frameworks managed by the respective national governments. Utility A is required by a Parliamentary Act to enter into a performance contract with its parent Ministry, while Utility B won a ten-year lease contract with government in 1996 to operate and maintain water service facilities and resources; manage billing and cost recovery; maintain customer relations; and extend network connections. The lease contract was subsequently extended for a further five years, and, at the time of writing this report, was further extended until December 2012.

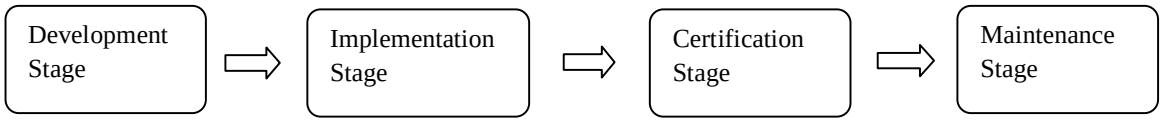
At the time of the study, Utility B's top management was comprised of the Director General and his two deputies, heads of 11 functional directorates, and 12 regional directorates. Utility A was governed by a Managing Director, assisted by chief managers heading several service divisions. On the issue of internal accountability, both utilities

had a reward/penalty-based performance management system linked to the corporate strategy and plan. The performance management system developed by Utility A is more elaborate, and apply to lower decentralised units.

Process of establishing, implementing and maintaining ISO 9000 QMS

The key stages of implementing ISO 9000 QMS are shown in Figure 3. In the development stage, the organisation should assess its business activities and consider how the implementation of ISO 9000 can best serve the needs and expectations of its customers, suppliers and other major stakeholder groups. Based on an analysis of the organisation's existing systems, the second stage involves (re)designing and developing new systems, integrating the ISO 9000 standards with practices already in place, and producing the necessary documentation. The third stage, which is optional, is about assessors from an accredited registration body examining the documentation and then auditing the system to verify that what is shown in the document is what actually happens in reality. The maintenance stage involves monitoring and measuring the changes achieved, soliciting for feedback on the performance of the quality management system, and acting on them so that as to continuously improve performance. Next, the case study utilities are analysed with respect to each of these implementing stages.

Figure 3: Key stage of implementing ISO 9001 QMS



The development stage

The motivation for developing ISO 9001 QMS for both utilities originated from the top leadership. In the case of Utility A, the main motivations, initiated by the Managing Director, were to improve the utility's corporate image and standardise business processes across the whole utility. Similarly, implementation of ISO 9001 by Utility B was initiated by the Group CEO (at international level) and the Director General of the utility, as part of the global movement to adopt QMS in the whole group and get ISO 9001 certification. For Utility B, ISO 9001 certification was also relevant for operationalising the lease contract. ISO 9001 certification covered activities and processes for providing water supply services in both utilities.

The development process in Utility B started in 1996, with the appointment of a working team composed of process owners and quality correspondents. After training in ISO 9001 QMS, the team developed and documented the critical activities and processes. The appointment of a Quality Manager in 1999 was an important milestone in the development process, culminating into certification in 2002. Activities of production, distribution, operations and customer services in all areas of operation were included in the scope for ISO certification from the beginning. Later, the scope was extended to cover finance, accounting, budget planning and control, maintenance, purchasing and logistics. In Utility A, the process for certifying the first two service areas took a shorter time. However, a step-wise certification of a couple of service areas was carried out, and lessons learnt, before certifying more service areas. Additionally, Utility A opted for a project-based approach to developing and implementing the ISO 9001 standards. Processes for services areas of Utility A presented for certification were water treatment, water quality management, storage, distribution, maintenance, procurement/inventory management, block-mapping/GIS, IT and customer services. The certification for the Head Office of Utility A covered corporate planning, management and monitoring of the service areas.

Utility B's top management fully participated in the development process – the head of department (HOD) was the process owner with respect to QMSs in his/her department, and personally got involved in the design of the policy, sensitisation, and training of staff, as well as deployment and implementation of the policy, strategy and plans with respect to QMS in the department. Additionally, each department/unit designated a quality correspondent, who served as a focal person, carried out important aspects of the day-to-day management of the QMS on behalf of the HOD, and linked the Site Managers with the Department of Quality Management. The role definition was similar in Utility A. The sitting manager of the Utility A's service area seeking ISO 9001 certification was the Quality Coordinator, under the overall supervision of the utility's overall Quality Manager. The Quality Coordinator in the service area chaired the ISO working committee, made up of all process owners. The working committee, which varied between 10-20 staff, depending on the size of the business unit, was responsible for establishing, documenting, implementing and maintaining ISO 9001 QMS in their areas of operation.

In Utility B, the quality manual was written by the Quality Manager, approved by the MD, and was updated annually. Procedures and work instructions, and forms related to each process were developed by process owners,

were validated by the management committee (CODIR), approved by the MD, and deployed into operation by the Quality Correspondent in each Unit. There were a total of 20 processes in Utility B, 35 procedures (six of which are ISO 9001 mandatory) and various work instructions and forms. These were all stored in hard and soft copies in a centralised server by the Quality Manager. In Utility A, documentation of the quality manual, vision, mission, quality policy, procedures and work instructions was done through full participation and a brainstorming session by the committee members. These documents were tailor-made to conform to the processes and activities in the respective service areas, and conformed to the overall 3-year corporate plan, which enhanced user-friendliness and acceptability of the developed documents. Utility A documented six mandatory procedures plus another set of optional procedures that covered critical business processes, alongside the critical activities – documented as work instructions. Its staff developed the ISO 9001 systems under close supervision of a quality management consultant, after attending a tailor-made training programme facilitated by the same consultant. The development process of QMS took 30-45 man-days in Utility A. In the case of Utility B, an external consultant was deployed at the beginning to train a core quality management team in the initial stages of the development process, who subsequently managed the implementation process.

The implementation stage

For Utility A, the consultant conducted on-spot reviews, and provided guidance to the ISO team. In Utility B, process owners were supported by the Quality Manager, who in turn was supported by the whole senior management team. In Utility B, QMS had been fully integrated into the corporate day-to-day activities, and its implementation constituted a priority performance objective for the senior management team, as it was the major management system being applied. ISO 9000 QMS were less mainstreamed in Utility A, where other change management programmes were running concurrently. Both utilities considered capacity development an important component of the implementation process and provided training for key staff in the relevant ISO 9001 documentation and implementation. Specifically, the audit capacity was built through comprehensive training of selected staffs, who conducted regular internal audits in an independent and impartial manner.

In Utility A, the internal audits formed a basis for monitoring and evaluation of the QMS, which results were fed into management review meetings that were conducted by the management team to generate action plans for consolidation of successes and improvement where shortfall existed. Internal audits in Utility B were a basis for review of processes, management review, business/activities review, legal requirements reviews, customer reviews and ad-hoc committees. Key performance indicators from Utility B's lease contract were used for the M&E process. Utility B used a programme approach in the implementation of ISO 9001 QMS, which emphasised the participation, involvement and ownership of the programme by the staff. This was not the case in Utility A, where, for example, senior management were involved in ISO 9001 QMS implementation, mainly by delegation, through the Quality Control Manager.

The certification audit stage

The certification audit process is a standard procedure and was similar in both utilities. Quality Managers played a leading role in ensuring that requirements for certification were put in place before external auditors were invited. The requirements included the identification and documentation of the processes, the interaction and sequence of the processes, and the development of operational procedures and associated work instructions. Both utilities had running contracts with international certification firms, which covered the initial certification and surveillance audits. The certification auditors examined the documentation and then audited the system, to verify (i) compliance to prevailing requirements; (ii) knowledge of QMS requirements; (iii) how suitable and effective the QMS is with respect to overall utility business, level of QMS application in day-to-day work practices; (iv) the performance of QMS alongside other existing management approaches, and (v) opportunities for QMS improvement.

The certification audit was completed only after all identified non-conformances had been addressed. Comprehensive audit reports with respect to the audit findings were then written and submitted to the respective utilities, after which certificates of compliance, valid for three years, were issued. In both utilities, the certification audit firm was also contracted to carry out annual surveillance audits. Utility B paid €13,000 for the certification audit of all operations of Utility B, and half the amount for surveillance activities. In the case of Utility A, the total cost for its 23 service towns and head office added to US$52,000 for certification audit, and US$40,100 for surveillance fees.

The maintenance stage

Maintaining and continually improving the QMS requires a sustained focus and vision to keep the effectiveness of the ISO 9001 QMS beyond the certification stage. In Utility B, maintenance was achieved through a comprehensive strategy, comprised of post-certification audit, regular internal audits, annual surveillance audits, review meetings, and continuous needs-based training. Similarly, Utility A developed internal QMS audit capacity to plan and execute bi-annual internal audits; and provided regular refresher training to continuously improve the skills and capacity of the internal audit staff. In addition, Utility A's contract with certification auditors ran for three-year period, during which annual surveillance audits were conducted, and reports submitted for management reviews. In both organisations, various significant changes that took place in the period of implementing ISO 9000 QMSs led to updating of the QMS documentation, so as to keep the QMS relevant to the existing business environment. Monitoring and evaluation activities in Utility A were managed by Branch Managers of the respective ISO certified service areas. In the case of Utility B, this function was managed by Heads of Department, who were members of the senior management team. As already mentioned, ISO 9001 QMS was programme-based, and was the main management system applied in Utility B. As a result, contrary to the norm in Utility A, all members of senior management in Utility B fully participated in the QMS maintenance processes and were fully accountable for the effectiveness of the QMS.

Using ISO 9000 QMS for achieving sustained performance

In this subsection, we briefly describe the extent to which senior management in the two case study water utilities applied ISO 9000 QMS framework for guiding their organisations towards improved performance. The discussion is structured according to the institutional aspects that were drawn from the ISO 9000 QMS documents, which were listed in the previous section. The item 'establishment, implementation and maintenance of quality management systems' is not included, as this has been exclusively presented in the previous sub-suction.

Strategy/policy formulation and planning

Policy formulation and strategic planning processes were well developed in both utilities. In Utility B the corporate planning cycle was five years - policies, objectives, strategies and plans are fully defined as required by the lease contract. The planning process took into account research into, and analysis of the trends in the external environment. Similarly, Utility A revised its corporate plan every three years, which was developed by Head Office, and on which service areas based their business plans. During the development of QMS documentation, Utility A aligned the quality policy, vision, mission and objectives with those of the corporate plan and the business plans of the service areas.

In both utilities, there was a clear vision and mission statement, and the organisational values were formulated and communicated in a transparent manner, hence creating a common sense of direction for the organisation. Both organisations carried out customer satisfaction surveys, whose results fed into regular corporate-wide workshops to evaluate the strategic objectives and plans. While Utility B endeavoured to integrate the needs of a broader range of interested stakeholders, such as required under the lease contract, Utility A's strategic planning process was highly informed by the statutory requirements spelt out in its performance contract with Government.

Strategic leadership

Both case study utilities were well endowed with good, strategic leadership, as attested by the respondents. Top management in both utilities facilitated and empowered staff at various levels to ensure participation in utility affairs by all staff. Management in both utilities was decentralized, resource planning carried out at different levels, which ensured that the resources were effectively utilized and accounted for, maintaining a right balance between strategic and operational activities. In Utility B, all staff interviewed agreed that top management were competent and had good managerial skills. Utility B's leadership was based on sustained shared values, fairness and acted as ethical role models at all levels, emulated by top managers. Through walking the talk, Utility B's top managers created trust, eliminated fear, inspired and encouraged other staff in the utility; they had an established mechanism for improving management systems and encouraging a learning culture in the utility. Feedback on leadership effectiveness was solicited from customers, staff and key suppliers, and was acted upon for continuous improvement. Leadership teams for both case study utilities supported benchmarking with other utilities in the region. There was evidence that both leadership teams were recognized as being in the league of top-in-class world leaders in the sector.

Customer focus

Since ISO 9001 certification, both utilities made tremendous progress to becoming more responsive to customer needs. The vision, mission, objectives and strategies for both utilities reflected the philosophy of customer focus, and this was communicated through slogans clearly displayed at various points of vantage. The profile of customer service was high in both utilities, as evidenced by the fact that the responsible officers were members of Senior

Management. In both utilities, the customer service function was grouped together with billing and revenue collection function, a practice that makes it easier to manage customer complaints regarding billing and revenue collection tasks, which normally account for a lion's share of complaints from customers in low-income countries.

There were designated front desk officers throughout service areas in both the utilities to receive and record customer feedback, which were relayed to the relevant service units for appropriate action. There were other channels used for receiving customer feedback. These included 24-hour telephone (toll free) hotlines, SMS services, and through the website. The latter communication channel was more developed for Utility A, whose website clearly displayed the customer charter, and had an online contact form sent to a support team, rather than through email. Other channels of communication used were radio talk-shows, TV panel discussions, and visits to areas with specific complaints. Utility B put emphasis on training of customer services staff, and used customer service software (called SAPHIR) for training customer-interface employees. Both utilities carried out customer satisfaction surveys as part of their performance measurement requirements. Whereas the performance contract for Utility A specified a customer survey every two years, the lease contract for Utility B required a customer survey every five years. A five-year interval is considered a long time for effectively monitoring customer satisfaction trends - management of Utility B recognized this shortcoming and had developed parallel tools to collect customers' perceptions in a shorter interval.

Management of human resources

Human Resources Management (HRM) processes were defined, measured, and reviewed with the management system of both case study utilities, and the HRM function was headed by a member of senior management team. Training and capacity development was a high priority in Utility A, with most supervisory staff having postgraduate qualifications. The procedures for recruitment, training, and exit were redefined during the ISO 9000 QMS development and implementation stages by both utilities. Performance management systems were in place in both utilities. In Utility B, there were systems and procedures for carrying out annual assessment of competence and performance against objectives agreed upon between each staff and his/her line manager. Sixty-five percent of the staff pay was performance-based, and skills gaps were identified and were addressed through training. The incentive-based performance management system in Utility A was comprehensive and more advanced.

In Utility B, staffs carried out self-assessment through internal review of activities (within the unit), process review (with other departments), management reviews and progress review staff meetings ('pacts of progress'). These general meetings were used for sharing experiences and offered an opportunity for internal benchmarking, on a voluntary basis. The meetings were conducted in a participatory and democratic environment, and enabled staffs to discuss individual and/or group problems associated with work or general welfare. The meetings were also used for the utility's general staff membership to review the performance of various departments. The staff general meetings contributed to the significant levels of staff participation, motivation and empowerment. Utility A put emphasis on good work environment for its staffs and provided competitive conditions of service in the national job market. HRM and estates departments periodically reviewed the suitability of the work environment, and appropriate actions were taken when need arose. At the time of the study, an international HRM firm was conducting a staff satisfaction survey for Utility A. However, some interviewed staffs in Utility A mentioned stagnation in staff promotion and remuneration based on the increasing cost of living, as areas that needed improvements at the time.

Management of other key resources

There was a structured process for planning, identifying, providing, and monitoring financial resources, information and technology in both water utilities. The same applied for infrastructure, but to a smaller extent in Utility B, whose contractual scope excluded asset renewal. In Utility A, allocation of financial resources depended on expressed needs of the requesting service area or unit, in consideration of how the planned activities would result into effective service delivery. Utility B had a sound reporting system which informed periodic management reviews that were conducted to assess the availability and adequacy of the financial resources. Similarly, Utility A's management regularly evaluated availability and adequacy of the required resource in the short and long-term periods.

Both utilities had structures and systems for relating with external suppliers. Utility B had a mechanism in place for periodically identifying, selecting, evaluating, ranking suppliers according to strategic needs, risks and customer-rated performance. There were mechanisms in Utility B for developing and managing relationships with key suppliers of fuel, telecommunication services, and spare parts; as well as developing and maintaining mutually beneficial relationships. However, it was noted that the scope of the relationship with key suppliers needed to be broadened to include their development. Utility A also maintained running contracts with suppliers of key consumables such as water treatment chemicals, pipe and fittings for new connections and network maintenance,

and fuel for transport fleet and generators; as well as running service contracts for special services such as security services. These contracts were reviewed regularly to ensure commitment to quality.

In line with the lease contract, there was an assets maintenance and renewal programme in Utility B, based on systematic audit of the infrastructure performance and age. Operations and works (responsible for maintenance) functions in Utility B were separated so as to clarify the roles and responsibilities. On the part of Utility A, a target on 'capital works implemented as a percentage of the budget' featured as a key performance target under the performance contract with central government. However, there seemed to be no focus on measuring the important function of asset maintenance as part of the asset management and planning.

Information, knowledge management and communication

There were processes in place in both utilities to identify, obtain, protect, use and evaluate information and knowledge. In Utility B, the IT Department provided horizontal support to other departments in terms of processing of data, and there were two statistics units that collected data, which were analysed by the Budget Department, for use during the review and decision-making processes. The information management system (MIS) benefitted from suggestions for improvement from staff learning experiences and feedback from customers, partners and suppliers. However, most of this information was manually collected and captured, hence reducing efficiency and effectiveness of the MIS. Senior management of Utility B were aware of this shortcoming and had plans to upgrade the information technology. Utility A's information and knowledge management systems were more advanced, as most of the data capture was fully automated.

Both utilities had developed systems to communicate to their staff and other relevant external stakeholders. In Utility A, key staff had a well-developed multi-channel communication system comprised of utility-subscribed mobile phones with email/internet connections, lotus notes, regular meetings, and an in-house magazine. There were periodic quarterly reviews for information and knowledge sharing, which kept key staff abreast with performance related issues, and provided a platform for expression of individual views and sharing of experiences on pertinent business issues. The deliberations of these review meetings were well documented and uniquely labelled according to the place and date of meeting. General staff meetings were also held on a monthly basis in Utility A's service areas, in which changes in strategies and plans were communicated to the staff. Similarly, in addition to the general progress meetings (i.e. 'pacts of progress' forums), Utility B organized regular meetings with staff and labour unions. It also had various events for communication such as the Objective Day that brought together about 200 employees, as well as award ceremonies to staff.

Communication to relevant external stakeholders was a key function in both utilities. Utility A issued regular press releases on important issues concerning service delivery, through various channels of electronic and print media. Utility A also maintained an interactive website which was regularly updated. Customers could receive their water bills instantly and verify their accounts status using mobile phones. Both utilities facilitated the formation of local water committees to improve stakeholder involvement in service delivery, and regularly hosted visits from customer associations and policy makers.

Business process management

Based on the interviews and documents reviewed, key and supporting processes necessary for creating customer satisfaction had been well defined and documented in both utilities. These processes were planned, managed and documented by competent staff to ensure maximum output and conformity to relevant specifications. In the initial development stages of ISO 9001 QMS, the business process interactions/interfaces were defined and mapped in business process flowcharts. These flowcharts then became an integral part of the QMS documentation. Clear responsibility and authority for management of the processes were assigned to 'process owners', who were considered competent.

The interrelationship between the various processes were defined and managed in line with available resources. Through regular internal quality audits and management reviews, performance of the defined business processes was assessed and improvements made at the process owner level. Findings from Utility B indicated that process planning was fully integrated with strategy deployment, and the needs and expectations of interested parties were considered in the process planning. Respondents from both utilities highlighted the process/system approach to management as a key benefit of implementing ISO 9001 QMS, which has led to improved, consistent and predictable results.

Monitoring, measuring, analysis and review

Monitoring, measuring, analysis and review were key functions in both utilities. In compliance with Clause 8.2.2 of the ISO 9001 standards, nominated staff and managers of Utility A were trained in basic audit principles and were charged with the responsibility of monitoring the performance of QMS processes. In addition, staff of the Internal

Audit Department that were hitherto more biased to financial accountability were trained to carry out holistic and system-based internal audits. Results of the internal audits were presented for management reviews. Similarly, Utility B conducted regular and systematic internal audits and reviews of activities, processes and performance. The monitoring system in Utility B extended to interactions with staff, key suppliers and other partners, from whom feedback was solicited and used to identify needs and expectations of interested parties.

Utility A had a monitoring and evaluation department which was headed by a senior manager. Based at the utility's headquarters, staffs in this department were constantly collecting data on KPIs for each service area, as documented in the M&E framework. These data were systematically analysed, reviewed and presented at quarterly performance review meetings, where all operating areas and service units were represented. In these meetings, key staffs shared findings, learned from each other, and formulated strategies for improvement.

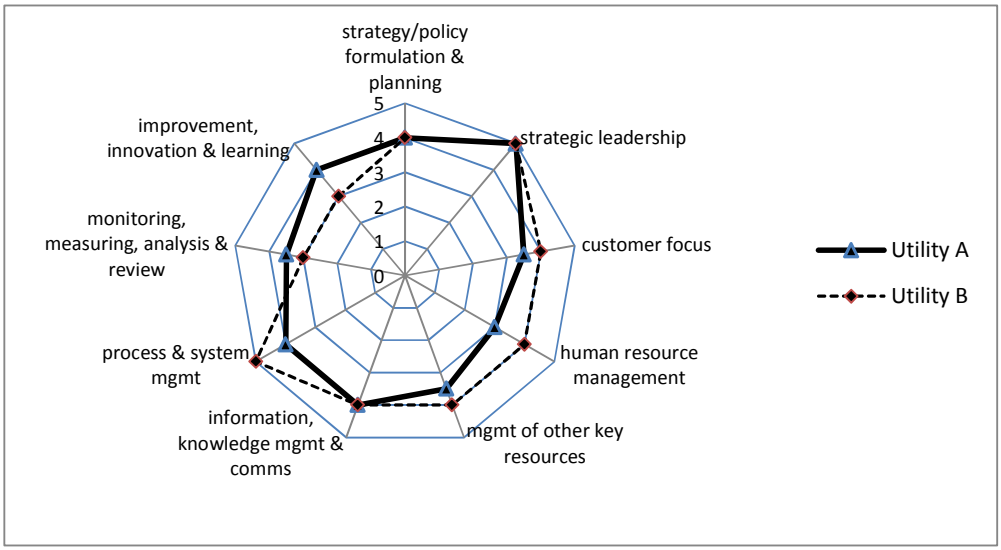
Improvement, Innovation and learning

Both utilities had initiatives for improving processes, based on corrective and preventive measures. For instance, Utility A had taken advantage of the innovations in the telecommunication industry in country to use mobile phone applications for updating customers' accounts and receiving payments from them. Similar examples occurred in Utility B, showing evidence in both utilities of improvement of key processes, whose focus was aligned to the corporate strategy and objectives. Both utilities also had mechanisms and forums for sharing information for continuous improvement. Although there was a system for rewarding performance in both utilities, it is not clear from the findings of the case studies that part of this incentive was specified for recognizing positive results obtained from suggestions or lessons.

Perceived maturity levels of the case study utilities

The researchers conducting fieldwork were asked to score the perceived maturity level (lowest with a score of 1, and highest with a score of 5) for each of the two utilities in terms of the dimensions described above, using the self-assessment tool developed by ISO, which was described on page 15. The perceived scores are illustrated in Figure 4. The figure shows that both utilities were at comparable maturity levels, and underpinned strategic leadership as a key success factor. Whereas Utility A was perceived to be better in terms of improvements, innovations and learning, Utility B had more robust processes and systems; and its human resources were better mobilized for ISO 9000 QMS. Utility A's better performance in innovations and learning may partly have been attributed to a more vibrant business environment in which it operated. Utility B's more robust processes and systems could have been mainly due to a program-based, longer, internally-driven, and systemic development process that the organisation went through, prior to the implementation of ISO 9001 QMS.

Figure 4: Radar diagram comparing perceived maturity levels of the case study utilities



The results of the case study show that both utilities had a high potential to achieve sustained growth, albeit propelled by different core competences. Whereas Utility A's strengths lay in technologically-based innovations, Utility B's strengths are were in people-centred process management. It is worth pointing out that Utility A's core

competences had been developed over time, prior to the implementation of ISO 9000 QMS, through a series of organizational capacity development and change management programs. On the other hand, Utility B had had a development process that is closely aligned and largely related to the implementation of ISO 9001 quality management framework. Therefore, the organizational growth of Utility B could largely be attributed to ISO 9001 QMS, which could not be said of the improvements in Utility A. However, the findings of this case study show that improvements in process and systems management in both utilities are mainly as a result of implementation of ISO 9001 QMS. The next sub-section summarises the results of responses received from the utilities' managers and staff, when asked about the added benefits of implementation of ISO 9000 QMS.

Added benefits from ISO 9000 QMS: perceptions from utility staff

Results from managers' questionnaires and interviews

Table 9: Summary of results questionnaire/interviews to managers and staff on perceived benefits from implementation of ISO 9000 QMS

Dimension	Aspect	Average Score	
		A	B
Strategy, formulation & planning	The needs and expectations of all interested parties are better understood; hence more visible and expected results.	4	4
	Quality policy is translated into measurable objectives and plans, hence clearer focus on important areas	4	5
Strategic leadership	The strategic leadership convinces, inspires and motivates staff of the utility to work as a team	4	4
	The leadership's unity of purpose enables QMS activities to be evaluated, aligned & implemented in a unified way.	4	5
Customer focus	The utility is more responsive and flexible to customer needs, hence increased revenue and customer base.	4	4
	The utility has become more effective in the use of the resources to enhance customer satisfaction.	4	4
Implementing/ maintaining QMS	QMS in the utility have led to more effective use of resources, hence resulting into lower costs and shorter cycles.	4	5
	QMS have led to sustained customer satisfaction, by delivering quality service bundles and providing support functions that meet customers' needs and expectations.	4	4
Management of HR	Recognizing staffs as the most important resource for implementing QMS, and good HRM practices has resulted into staffs' eagerness to participate in, and contribute to continual improvement.	3	4
	Good HRM practices have resulted into staffs' innovation and creativity in furthering the utility's objectives.	3	4
Management of other key resources	Good practices in managing other key resources have enhanced the utility's understanding of restrictions and opportunities to ensure that corporate objectives and plans are achievable.	4	4
	Recognizing suppliers and other partners as an important resource has led to optimization of costs and resources	3	4
Information, knowledge management & communication	Good practices in processing data, and managing information and knowledge as an essential resource has increased the utility's ability to make informed decisions.	4	3
	Effective communication of the utility's strategy, policies and plans to staff and other interested parties leads to an organization-wide and comprehensive approach and clarifies roles, responsibilities and linkages in the QMS	4	4
Process & system management	Adopting a process approach has led to improved, consistent and predictable results	4	4
	Applying a systems approach to management has led to an integration and alignment of processes that best achieves the desired results, and increased the utility's ability to focus on the key processes.	4	5
Monitoring, measuring, analysis & review	Monitoring, analysis and review processes have ensured effective and efficient measurement, collection and validation of data for improvement.	4	3
	Regular monitoring analysis and review processes have enabled the utility to provide sustained services in an ever changing and uncertain environment.	4	4
Improvement, innovation & learning	The utility's focus on activities for improvement, innovation and learning has created a performance advantage through improved organizational capabilities.	4	4
	Improvement, innovation and learning culture has enhanced the utility's flexibility to react quickly to opportunities.	3	3

A questionnaire to assess perceived benefits derived from applying the ISO 9000 QMS was individually filled by 10 middle- and senior managers in Utility A. Respondents were asked to indicate to what extent they agreed with statements concerning benefits from applying ISO 9001 QMS. The responses were graded on a sliding Likert scale comprised of 1 (strongly disagree), 2 (disagree), 3 (neutral/not sure), 4 (agree), and 5 (strongly agree). In Utility B, the questionnaire was collectively discussed by some senior managers of Utility B, and triangulated through the interviews with three other members of senior management. The results of the response are summarised in Table 9.

The results in Table 9 show that staff in both utilities perceived to have obtained significant benefits from implementing ISO 9001 QMS in terms of strategy/policy formulation and planning; strategic leadership; customer focus; and process and business management. However, implementation of QMS has brought about relatively less improvement in the learning culture of both utilities. For Utility A, relatively less improvement had occurred in terms of good practices for human resources management and supplier/partner relationships. In the case of Utility B, implementation of QMS had led to relatively lower improvements in aspects of information/knowledge management; and measurement, collection and validation of data for improvement.

Results from staff focus group discussions

The results from focus group discussions (FGD) triangulate the findings from interviews and questionnaires. Frontline staff in Utility B that participated in the focus group confirmed that there was a high level of staff participation in the development, certification and implementation stages of QMS, including definition and documentation of the procedures. Staffs were fully sensitized about the importance of ISO 9001 implementation, and staffs that deviated from procedures were reminded of 'not conforming', a name-and-shame method of encouraging change by staff. This position conformed to characteristics of a programme-based approach. Utility B staffs were unanimous about entrenchment of the ISO 9001 quality management framework and the resulting positive change that had occurred in planning, organisation of activities in the organisation, since ISO 9001 certification.

The FGD respondents in Utility A highlighted some difficulties in implementing ISO 9001 QMS in parallel with other change management programmes. It was pointed out some senior managers did not believe in working through defined systems - rather, their focus was on achieving desired results, using other methods. Yet, FGD respondents in Utility A listed management support, buy-in and commitment as the most important drivers for the success of ISO 90001 QMS. Other success factors mentioned were provision of resources and staff sensitisation. Similar success factors were discussed by respondents in Utility B – full participation of senior management, staff mobilisation and provision of the necessary material and human resources.

FGD participants from both utilities agreed that adopting ISO 9001 QMS had provided benefits for their organisations. For respondents in Utility A, the main benefits were in terms of documented management systems; improved corporate image; continual improvement through internal quality audits, surveillance audits and management reviews; and development of internal capacity in process/business management and development of staff skills. On the side of respondents from Utility B, the main benefits were in terms of improved performance; higher customer satisfaction and improvements in the employee terms of conditions in the medium term.

There were marked differences in opinions between staff of the two water utilities concerning the downsides of adopting ISO 9001 QMS. Respondents from Utility A were concerned that monetary benefits from implementing ISO 9001 QMS were long-term rather than short- or medium-term. Staff in Utility B held similar views, but indicated that they had already started reaping the monetary benefits, which had even trickled through to the level of individual employee benefits. Other shortcomings enumerated by respondents in Utility A were the higher level of competences required of the participating staff – especially in terms of systems thinking, process approach, reading culture and documentation; the high costs associated with ISO 9001 QMS development and application; and the large volume of documents required. For respondents in Utility B, the major shortcoming was for ISO 9001 certification to be considered as a panacea or an end in itself, rather than a vehicle for continuous performance improvement – this perception could increase the risk of a down turn of trends in performance.

Comparison of perceptions by management and staff of the two utilities

The perceptions of Utility B managers and staff with respect to benefits accruing from implementing ISO 9001 QMS were in alignment. Both categories agreed that ISO 9000 QMS framework had been a driver for performance improvement, and had enabled staff and management to focus on the core business activities for providing quality services to the customers. Staff and managers of Utility B recognised that the operating environments was continuously changing, and the utility needed to make improvements in human resource management; relations with

suppliers and other partners; information and knowledge management; and create conditions for innovations. Nonetheless, it was perceived by both staff and managers of Utility B that ISO 9001 certification had provided a strong footing for the utility to progress to higher levels of maturity.

As discussed in an earlier sub- section, Utility A had implemented other change management programmes before ISO 9001 certification, and during the implementation ISO 9000 QMS. As a result, Utility A staffs were not sure whether performance gains by the utility could be attributed to implementation of ISO 9000 QMS. Both staffs and senior managers of Utility A recognised that implementation of ISO 9000 improved corporate image and business process management. However, the staffs perceived ISO QMS implementation as a costly and cumbersome venture (with extensive documentation requirements) whose benefits were not easily translated into monetary terms. Furthermore, staff of Utility A that took part in the FGD pointed out that the ISO 9000 quality management framework could provide more benefits for a utility at a maturity level lower than the one at which Utility A was at the time of developing ISO 9000 QMS.

Trends of key performance indicators

Table 10 provides key performance indicators for the two case study utilities before and after ISO 9001 certification, which are compared with mean performance indicators of 49 utilities in Western Africa and 32 utilities in Eastern Africa. Whereas baseline data for Utility A was a few months prior to the ISO certification milestone, the data provided for Utility B is two years before certification. On the whole, compared to Utility A, Utility B started off from higher performance levels in terms of effectiveness and efficiency. Both utilities made improvements in performance, with Utility A making higher gains in service coverage and compliance to water quality standards. In comparison with performance of water utilities in the region, Utility B had much higher performance levels in all dimensions prior to ISO 9001 certification, and made further improvements. Similarly, Utility A's performance in bill collection efficiency, staff productivity index and management of non-revenue water was above average even before ISO 9001 certification. But as pointed out by its staffs, Utility A was concurrently implementing other change management programmes, which brings into focus attrition issues.

Table 10: Utility-wide performance trends before and after ISO 9001 certification for the two utilities, compared with mean performance of utilities in the region.

	Utility A		Utility B		2006 mean performance of utilities*	
	2003	2010	2000	2009	Western Africa	Eastern Africa
Customer base (Number of customers)	87,172	246,259	298,737	502,038		
Population coverage (Percentage)	63%	74%	79%	99%	52%	66%
Collection efficiency (Percentage)	89%	99%	96%	9%	56%	76%
Staff productivity (Staff/1000 connections)	10	7	3.96	2.26	14	23
Non-revenue water (Percentage)	36%	33%	26%	21%	34%	38%
Compliance to WQ standards (Percentage of WQ samples)	65%	85%	978%	99%	*Data not available*	

*Source: Water Operators Partnerships – Africa [93]

CONCLUSION

The primary question for this study was: Do ISO 9001 quality management systems offer a sound framework for evaluating institutional sustainability at the water utility level? This was subdivided into three sub-questions. For consistency, we present our conclusion according to these sub-questions.

How is institutional sustainability conceptualised in extant literature?

In general terms, institutional sustainability refers to the activities of a particular institution with respect to enablement and facilitation of decision-making and implementation of sustainability policies. To fully grasp the conceptualisation of institutional sustainability, it was necessary to first of all understand the conceptualisation of the root words of 'institutions' and 'sustainability'. Different academic disciplines have conceptualized 'institutions' in various ways, as dictated by their worldviews. The most dominant conceptualization of institutions in the literature stem from the political science and economics disciplines. In this paper, we have adopted the school of thought which conceptualises 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.

There are four main conceptualisation of sustainability reported in the literature. These are regard sustainability (i) as the continuation of the benefit flows; (ii) in terms of the longevity of the institution; (iii) as the ability of an organization to meet recurrent costs, after donor funding is exhausted; and (iv) as the capacity of an institution to generate a minimum level and quality of valued outputs over the long term. The first two conceptualisations present practical difficulties for evaluating institutional sustainability, while the third one is focussed on financial viability, which is only a component of sustainability in some, but not necessarily all development contexts. In this paper we recognise that institutional sustainability is an abstract concept, and therefore difficult to objectively measure. We therefore proposed to measure institutional capacity as a leading indicator for institutional sustainability. We have adapted the fourth school of thought and have conceptualised institutional capacity 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 has institutional capacity, and by extension institutional sustainability of water service providers and other relevant international development projects been evaluated in the literature?

There are few studies that have reported on the evaluation of institutional sustainability as applied in the water sector or specifically for water utilities. Two authors exclusively dealt with measurement of institutional sustainability for water utilities in developing countries. Another one focused on capabilities for implementing sustainable urban water management, which is also relevant for water-sensitive urban designs for cities in industrialised countries. Other relevant evaluation instruments reviewed were those developed by international donor agencies, which are generally applicable to public sector agencies in donation-recipient developing countries.

Most of the reviewed tools/guidelines conceptualised institutions in terms of rules and roles, and examined factors in the external and internal environments of the organisations. There were a number of factors that were common to most reviewed tools. These included factors in the external enabling environment (e.g. degree of autonomy, policy/legal framework), strategic direction, corporate leadership and organizational capacity in term of human resources, financial resources, systems/procedures, technical capacity etc. About half of the reviewed tools considered organisational performance as one of the dimensions of institutional capacity. This conforms to a school of thought advanced by some recent scholars that the relationship between performance and institutional capacity is bi-directional – given the right operating environment, improved organisational performance will lead to higher levels of institutional capacity, and vice versa.

Do ISO 9000 series of quality management guidelines offer a useful framework for continual improvement and increased likelihood of institutional sustainability at the water utility level?

Quality Management Systems (QMS) are composed of a management structure, responsibilities, procedures, mechanisms, processes and management resources used for implementation of the principles and action lines geared towards achievement of Total Quality Management (TQM). One of the definitions of TQM highlights the role of top management in mobilising everyone in the organisation to continuously perform all activities that are necessary for establishing and achieving standards which meet or exceed the needs and expectations of their customers [46]. This definition aligns quite well with the conceptualisation of institutional capacity that we have adopted in this paper, which is about continuous improvement in organisational performance. We reviewed a number of articles which examined the link between implementation of TQM and continuous improvements in organisational performance. Most of these articles reported strong significant relationships between implementation of quality management systems under the TQM philosophy, with organizational performance. It can be argued, therefore, that there is a plausible link between implementation of quality management systems under the TQM philosophy with Institutional Sustainability.

ISO 9000 series of QMS is the most popular and commonly implemented quality management framework. ISO 9000 family of standards is based on the concept that management systems are generic, and therefore focus on the control and continuous improvement of processes used to define, design, produce, evaluate and deliver the products/services. ISO 9000 places the responsibility for the establishment, performance and maintenance of the quality management system on the organization's top management. External certification is not a compulsory requirement for ISO 9000 series of standards, although ISO recognises that an organisation may engage an independent system certification body or consultant for ISO 9000 certification. There is no consensus in the reviewed literature on whether implementing ISO 9000 series of standards in public sector organisations like water utilities will lead to continuous improvements in their performance.

One of the main shortcomings of ISO 9000 series of standards, and particularly ISO 9001 standards is that it is tailored more to private manufacturing firms than public sector agencies – hence, it does not adequately cover

factors operating in the organisation's external environment, which are critical for performance of public sector organisations. Also, empirical research reported in extant literature highlighted the importance of the motivation for implementing ISO 9000 series of standards. If organisations cited achieving ISO 9001 certification (for whatever reasons) as their main objective, they were less likely to achieve improvements in organisational performance. Organisations that view implementation of ISO series of standards as a vehicle for performance improvements will achieve the performance-related objectives.

These findings were collaborated with findings from case study water utilities in sub-Saharan Africa. Whereas Utility B attached high value to ISO 9000 QMS as the main driver of performance improvement in the utility, Utility A was concurrently implementing other change management programmes, and its staff and managers did not value ISO 9000 QMS to the same extent. The main motivation of Utility B for applying for ISO 9001 certification was performance improvement through uniform implementation of quality management systems in the whole group of companies. Utility B used ISO 9001 QMS as a catalyst for change, and recognised it as a critical competitive strategy. As a result Utility B's senior management made ISO 9001 QMS a primary concern of all staff, with members of senior management providing leadership for its development and deployment. Hence, implementation of ISO 9000 QMS substantially achieved internal integration with Utility B's existing internal process and practices [94]. On the contrary, according to the Managing Director of Utility A, the main motivation of Utility A's application for ISO 9001 certification was '…to improve the utility's corporate image world over'.

To sum up, the literature review and case studies show that the quality management principles as advanced by ISO 9000 series of standards are manufacturing-centric; require threshold performance levels; and give inadequate consideration of factors in the external environment, which are critical for water utilities in developing countries. Furthermore, the extent to which ISO 9001 certification can effectively be used to guide utilities towards improved organisational performance largely depends on whether certification was the main objective, or is considered as an add-on benefit in the quest for continuous improvement. On the basis of these considerations, we can conclude that the ISO 9000 quality management systems *do not* necessarily offer a sound framework for continual improvement and increased likelihood of institutional sustainability for water utilities in India. There is need, therefore, to develop a more effective assessment tool for tracking a water utility's progress towards institutional sustainability.

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