WATER GLOBAL PRACTICE

Water Utility Turnaround Framework

A Guide for Improving Performance

Gerard Soppe, Nils Janson, and Scarlett Piantini

WORLD BANK GROUP

About the Water Global Practice

Launched in 2014, the World Bank Group's Water Global Practice brings together financing, knowledge, and implementation in one platform. By combining the Bank's global knowledge with country investments, this model generates more firepower for transformational solutions to help countries grow sustainably.

Please visit us at www.worldbank.org/water or follow us on Twitter at @WorldBankWater.

This work was financed by the Global Water Security & Sanitation Partnership (GWSP) and the Swiss State Secretariat for Economic Affairs (SECO).

Water Utility Turnaround Framework

A Guide for Improving Performance

Gerard Soppe, Nils Janson, and Scarlett Piantini

WORLD BANK GROUP

1818 H Street NW, Washington, DC 20433

Telephone: 202-473-1000; Internet: www.worldbank.org

Cover design: Jean Franz, Franz and Company, Inc.
Cover photo: © Imal Hashemi / Taimani Films / World Bank.

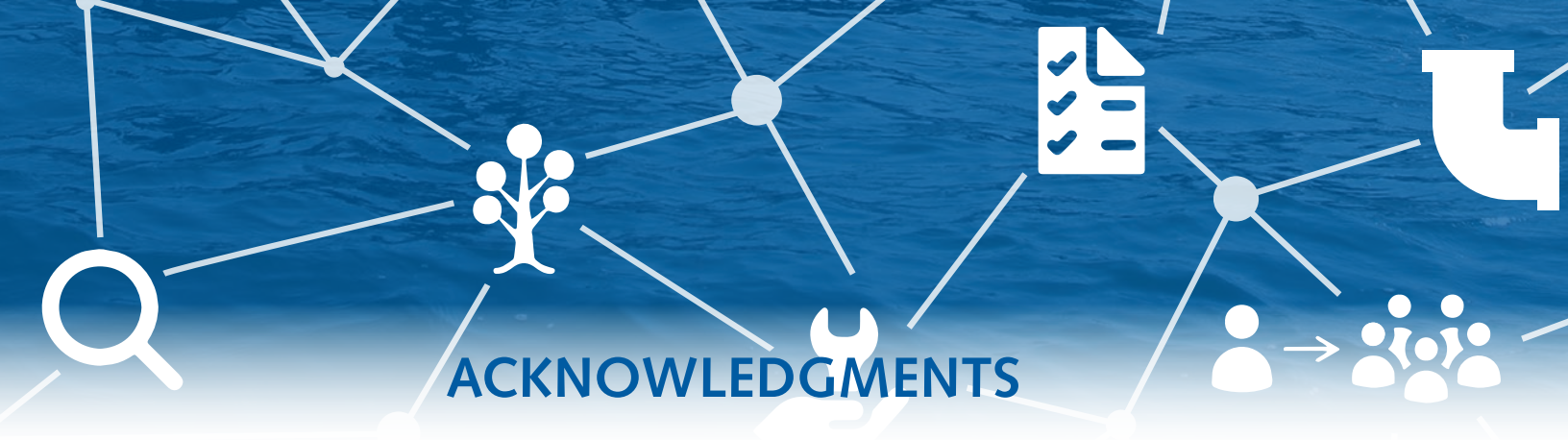
CONTENTS

Boxes

Figures

Maps

Tables



ACKNOWLEDGMENTS

This report is a product of the World Bank Water Global Practice's Water Utility Turnaround Framework Initiative and forms part of the WSS Global Solutions Group's agenda on Building Sustainable Urban Utilities. This work was financed by the Global Water Security & Sanitation Partnership (GWSP) and the Swiss State Secretariat for Economic Affairs (SECO). The study and this report have been developed by a World Bank team led by Gerard Soppe (Senior Water and Sanitation Specialist) and composed of Alex Bakalian (Lead WSS Specialist), William Kingdom (Lead WSS Specialist), and Christiaan Heymans (Senior WSS Utility Specialist), with support from Maria Angelica Sotomayor (Practice Manager). Special thanks to the team of Castalia for all their work on developing the framework—Nils Janson, Scarlett Piantini, Laura Saiki, Jaime Hurtado, and David Erhardt.

Valuable comments and inputs were received from peer reviewers Iain Menzies, Caroline van den Berg, Charles Delfieux, Pier Mantovani, Lizmara Kirchner, Smita Misra, Oscar Alvarado as well as from other colleagues during implementation and piloting of the framework in Vietnam and Botswana.

The development of the framework would not have been possible without the cooperation of the utilities that contributed to the case studies. Special thanks to the staff and stakeholders of the utilities that provided valuable information for the case studies and the pilots in Can Tho Wassco (Vietnam) and Water Utilities Corporation (Botswana). Inge Pakulski was responsible for developmental and copy editing.

EXECUTIVE SUMMARY

In many urban areas around the world, public utilities provide water supply and sanitation (WSS) services. While some of these urban public water and sanitation utilities ("water utilities") perform well, others suffer from the types of performance issues observed in many public sector entities, such as low operating and investment efficiency. The World Bank is promoting a three-pronged approach to enhance water utilities' performance: (i) strengthening the operational efficiency of the utility; (ii) improving the governing environment; and (iii) improving access to funding for WSS. This approach lies at the core of the water utility turnaround framework, elaborated in this report.

A framework for turning around poorly performing water utilities will benefit the management of these utilities, governments with responsibilities for water utilities, and those providing technical and financial support for improving the WSS sector. Despite dedicating substantial time and resources to water utilities, efforts to improve their performance seem to have run out of steam. Yet if water utilities manage to sustain a successful turnaround, billions of people will gain access to safely managed WSS services.

Improving the performance of water utilities is difficult because the problems they face are complex and multidimensional. Problems caused by dysfunctional political environments, combined with an entrenched backlog of inefficient practices, cannot be solved by applying standard technical and managerial techniques. Achieving a sustained turnaround requires a framework that integrates practical steps to increase a utility's operational and managerial efficiency with measures to reverse the dysfunctional political equilibria in which it operates. Ultimately, this is only possible if a utility is led by a competent manager who can guide utility staff and carry out critical changes. Dedicated leadership is essential to identify early gains that build credibility with stakeholders and instill confidence in staff that a turnaround is possible.

Using a comprehensive turnaround framework is the best approach to improve water utilities' performance and efficiency, and increase their ability to access finance, including commercial finance. Why does this matter? Evidence shows that water utilities with access to *commercial* finance are much more likely to achieve the Sustainable Development Goals (SDGs).

The Need for a Turnaround Framework

What does the public want from its water utilities? The answer is simple: sufficient, reliable, convenient, and safe water services. Water provision should be transparent, financially sustainable, and responsive to citizens.[1] Wastewater should be collected, treated, and discharged properly. The measures needed to improve the operational and managerial capacity of water

utilities are generally straightforward—information is readily available on, for instance, how to efficiently procure and build water treatment plants, and how to install meters for data acquisition to monitor performance.

Yet, although there are utilities that currently perform well, over half a billion people around the world still lack access to safe drinking water. The SDGs set the bar even higher: they require equitable access to safe and affordable drinking water for all. The problem is often that dysfunctional political economies tend to perpetuate the vicious cycles that sustain poor utility performance. Not surprisingly, as a water utility's operations and management are often closely linked to the political economy in which it operates.

Water Utilities' Poor Performance, Despite Repeated Interventions

While success stories are well publicized, many water utilities struggle to deliver safe water to their customers in a convenient and reliable manner. Today, over 660 million people lack access to safe drinking water, 157 million of whom live in urban areas. Over 159 million people use surface water to survive, risking water-borne illnesses that are often fatal (UNICEF and WHO 2015). Almost one infant death in five is due to water-borne illnesses (UNICEF and WHO 2009). Approximately 2.4 billion people lack access to sanitation, over 700 million of whom live in urban areas. Also, 946 million people defecate openly, 78 million of whom do so in urban areas (UNICEF and WHO 2015, 16).

Many water utilities have continued to perform poorly despite countless interventions. Donors have invested billions to improve water utility performance in developing countries—providing lending (and some grants) for capital investments, institutional reform, and technical assistance. For example, OECD Development Assistance Committee (DAC) members committed $10.6 billion between 2001 and 2006 (OECD/DAC Secretariat and the WWC 2008). The World Bank alone financed an estimated $18 billion worth of WSS projects between 2007 and 2011 (Kayaga, Mugabi, and Kingdom 2013, 17). And between 2009 and 2013, it approved over $16.9 billion for WSS projects (World Bank 2014).

Although past interventions have sometimes helped improve governing environments and utility management, many water utilities continue struggling to improve service sustainably. To a large extent, the political economy in which they operate is to blame for this. Understanding the political economy requires thorough mapping of and engaging with relevant stakeholders.

The Dysfunctional Political Economy

The political economies of poorly performing water utilities are often dysfunctional and perpetuate vicious cycles that sustain poor performance. As these vicious cycles worsen, water utilities' low credibility, little to no accountability, and limited autonomy are further eroded. Utility managers must develop virtuous cycles that counteract the vicious ones and create the credibility, accountability, and autonomy required to perform successfully.

In dysfunctional political economies, water utilities operate for purposes other than serving customers—for instance, to help government authorities secure votes by providing jobs or by promising water services to low-income customers at tariff levels below cost. Politicians

sometimes even use water utilities for personal gain. As such political interference benefits government authorities, it is difficult to stop.

When dysfunctions become the norm, vicious cycles that cripple performance develop inside the utility. This typically leaves managers with limited autonomy to make decisions about the allocation of resources for operations, the hiring and firing of staff, and capital investment projects. Against this background, it is unlikely that performance targets are set, let alone met. Under weak management, staff become apathetic and demotivated; the utility's operations become inefficient and poor-quality service is the result. Governments transfer funds in a manner that is unrelated to performance, effectively compensating for inefficiencies and perpetuating the vicious cycles (Muller, Simpson, and van Ginneken 2008, 4).

Turning around a water utility's performance requires effectively transforming the dysfunctional political economy in which it operates. Doing so entails developing virtuous cycles that stop downward spirals and create the credibility, accountability, and autonomy—or at least space for reform—required to perform successfully. Through these virtuous cycles, governments, customers, and other stakeholders (re)gain confidence in the water utility's ability to perform as expected, and to use its resources effectively and efficiently.

Inappropriate Model for Funding Water Utilities

Poorly performing water utilities waste much of their available funding on inefficient operations and poorly planned and executed capital investments. As a result, providers of capital are reluctant to commit resources they believe water utilities will use inefficiently. To counter this, the World Bank is developing a model that emphasizes efficient use of existing funding; better use of domestic funding; and leveraging concessional finance to attract more private finance to the WSS sector (Kolker 2017).

A more effective use of funds may be attained by increasing the efficiency of water utilities' operations and capital investments. Such efficiency enhancements will encourage governments to channel more resources to the sector, while also creating space for private lenders to provide substantially higher levels of financing.

Improving the Operational and Managerial Capacity

For a turnaround to succeed, it is critical to sequence and coordinate the steps to improve the operational and managerial capacity of water utilities, while at the same time remaining flexible enough to deal with unpredictable events. The actions that must be taken at different levels of maturity of a utility[2] are generally well known. For example, installing meters, updating the customer database, installing a new billing and collection system, and mapping of the location of pipes in a geographic information system (GIS) are all actions that will improve technical and financial performance. However, carrying out these actions without proper sequencing and coordination—as part of an overarching strategy—will fail to improve a water utility's operational and managerial capacity.

Past interventions found it challenging to properly sequence and coordinate actions. A turnaround framework should help in designing a systematic, coordinated, and prioritized approach

to improve operational and managerial capacity. Moreover, analyzing successful sequences and coordination strategies offers invaluable insights for a turnaround framework.

Empirical Evidence That Informed the Turnaround Framework

Water utilities worldwide have attempted to improve performance by sequencing actions to break vicious cycles that prevent sustainable change. The framework draws on their experience to develop practical guidelines for underperforming water utilities.

Five case studies yielded an in-depth understanding of the actions taken to improve performance. Findings from previous case studies allowed information to be compared and augmented the findings. This approach provided valuable empirical evidence about the decisions, actions, and external conditions that can transform a poorly performing water utility into a successful one. The evidence, from successful and unsuccessful cases studies alike, provided the foundation for the turnaround framework.

Sources of Empirical Evidence

The turnaround framework draws empirical evidence from water utilities that attempted to improve performance and operate in countries with different income levels and environments. Primary data were collected from five utilities: CESAN and SEDAPAR in South America, ONEA and SONEB in Sub-Saharan Africa, and DAWACO in Southeast Asia. SEDAPAR was the only utility that failed to sustain the improvements achieved during its turnaround process.

MAP ES.1. Turnaround Case Studies and Other Relevant Water Sector Studies

Source: Baietti, Kingdom, and van Ginneken 2006; Heymans et al. 2016; Engelsman and Leushuis 2016 (Rebel Group).

Previous studies on water utility performance—Baietti, Kingdom, and van Ginneken (2006); Heymans et al. (2016), and Engelsman and Leushuis (2016)—augmented the findings of the turnaround case studies. In all, an additional 15 water utilities were reviewed worldwide to pinpoint the factors behind their success (map ES.1).

Necessary Conditions Before Starting a Turnaround

The empirical evidence indicates that specific conditions need to exist before starting a utility turnaround. These necessary conditions include catalysts that provide space for change, a government leader who champions the required reforms, and a competent manager with sufficient managerial autonomy to implement changes. While the first two conditions are exogenous and offer an opportunity to start a turnaround, they do not by themselves ensure success.

Actions That Build the Operational and Managerial Capacity of Successful Utilities

Building the operational and managerial capacity of a water utility requires improvements in various areas that determine its degree of maturity: organization and strategy, and human resource and financial management, as well as commercial and technical operations. These improvements thrive in an enabling governing environment—the legal and governance context in which the utility operates.

Factors to Consider for Sequencing a Turnaround

Successful turnarounds rely on certain key actions being taken in roughly the same order, although the context and duration will vary. These actions include establishing a baseline, cleaning up finances, setting clearly defined objectives and targets, updating management information systems (MISs), and improving human resources.

In most of the cases studied, utilities established a baseline early in the turnaround as a key input for their future business plan. Utilities under significant financial distress next focused on achieving financial sustainability by increasing revenues and/or lowering costs. Subsequently, utilities translated the objectives they had set themselves into multiyear targets and developed sustainable business plans.

In almost all utilities studied, the first actions in their business plans were improving human resources and MISs. Once improvements were under way, some utilities focused on making sizable capital investments to meet ambitious targets. Most utilities reviewed signed performance contracts with the government at some point during their turnaround. This resulted in formal structures that defined the utility's expected performance, as well as the government's financial support to achieving it.

The Turnaround Framework

The turnaround framework provides water utilities with guidance on improving performance. It recognizes that poor performance can originate from internal factors as well as dysfunctional political economies, and proposes a systematic, coordinated, and prioritized approach to improve operational and managerial capacity. The framework requires expert judgment to make adjustments that reflect the specific context of a given utility.

The framework can be applied to any utility, regardless of its overall maturity and current performance level, and extent of dysfunction in its political economy equilibrium. It shows how to best use the space for change in such a situation, and coordinate and prioritize actions to improve a utility's operational and managerial capacity (figure ES.1).

The framework consists of four phases, each comprising several steps. Phase 0 is a *preliminary* phase in which the current state of the utility and its external environment are assessed. From the final step of phase 0, the utility should proceed to the phase that provides the kind of intervention it requires—some will be ready to move on to phase 2 or phase 3 (and skip phase 1 altogether), while others will first have to go through phase 1.

From phase 1 onward, all steps should be carried out sequentially and in the order set by the framework. Phase 1 will help the manager implement relatively small, low-cost interventions to build the credibility, accountability, and autonomy necessary to move on to phase 2. Phase 2 will allow management to develop and implement an *action* plan. Finally, in phase 3, management will be able to implement measures that continue to enhance the utility's maturity levels; institutionalize best practices; and allow it to develop long-term *strategic* plans.

Utilities can face many challenges at different times, and the improvement process may not be as linear as laid out in this report. However, the turnaround framework provides a foundation for thinking critically about these challenges in a sequential and stylized manner, and identifying the most relevant parts of the improvement process, given a utility's specific situation.

The costs and impacts of various interventions and actions proposed by the turnaround framework depend on a utility's specific context. It is therefore difficult to assess these accurately, but estimates are provided in Appendix B.

Tools of the Turnaround Framework

Several tools have been developed specifically for the turnaround framework: (i) a decision tool (for assessments); (ii) analysis tools (for identification of priority actions); and (iii)

FIGURE ES.1. The Turnaround Framework

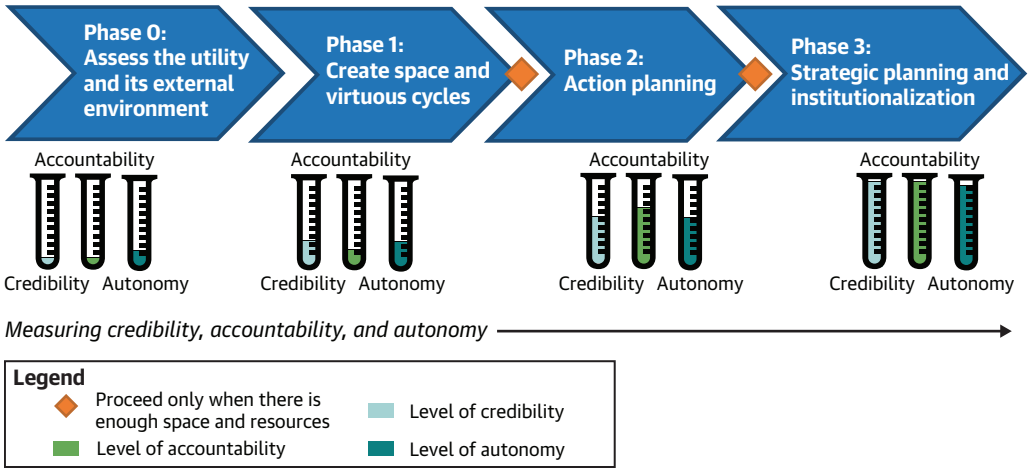


TABLE ES.1. Tools and Outputs in Each Phase

Name of tool or output	Phase 0	Phase 1	Phase 2	Phase 3
Decision tool	✓			
Analysis tools				
Performance table	✓	✓		
Initial maturity matrix	✓	✓		
Maturity matrices			✓	✓
Action matrices		✓	✓	✓
Navigation tools				
Phase 2 checklist	✓	✓		
Phase 3 checklist	✓		✓	
Outputs from the tools				
Performance cobweb	✓	✓		
Initial maturity cobweb	✓	✓		
Maturity cobweb			✓	✓

navigation tools (for navigation to the appropriate phase of the framework). Table ES.1 lists these tools and their corresponding outputs in the various phases.

Phase 0: Assess the Utility and Its External Environment

The framework's preliminary phase aims to identify the space for change by assessing the current state of the utility and its external environment, based on the following steps:[3]

- Evaluate the utility's turnaround need and current performance
- Assess the initial maturity of the utility's operational and managerial capacity
- Assess the utility's external environment
- Assess whether the conditions necessary to start a turnaround exist
- Assess the utility's readiness to prepare an action plan or a strategic plan
- Determine the next steps to be taken for improving the utility's performance.

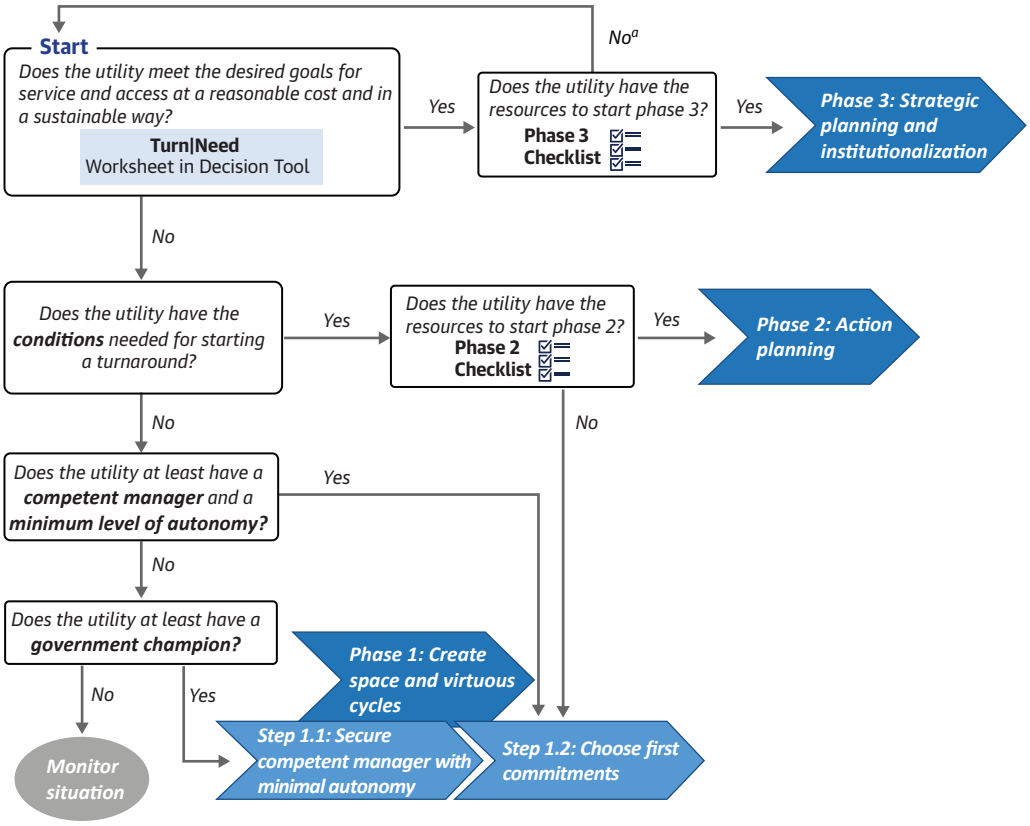
Once the diagnosis is completed, the utility can move on to a subsequent phase—which one depends on the outcomes of the phase 0 assessments (figure ES.2). Key determining factors in this context include whether a government champion and a competent manager exist, and whether management can devote time and resources to strategic planning.

Phase 1: Create Space and Virtuous Cycles

The purpose of this phase is to develop the credibility, accountability, and autonomy needed to develop and carry out an action plan. At the end of this phase, the utility should have used its initial space for reform to open a path to *systematic* reform.[4] Phase 1 consists of the following steps:

1. **Secure a competent manager with a minimal level of autonomy** if the utility does not have one yet.

FIGURE ES.2. Decision Tree to Determine Next Step for Improving the Utility



Note: a. If the utility is not ready to start with phase 3, its current performance and turnaround need may have to be reassessed. Having to reassess could mean that the utility is not meeting the goals of affordable service and access in a sustainable way. In this case, the utility may need to carry out a full-fledged turnaround and start with phase 1 or 2.

2. **Choose a first set of commitments.** The manager should make commitments that demonstrate willingness and ability to start improving performance. Selecting these commitments requires that the manager carefully analyze performance and initial maturity levels to identify weaknesses. Based on this analysis, the manager should first identify the root causes of poor performance and next define and prioritize low-cost, high-impact actions to address them.
3. **Deliver on first set of commitments.** The manager should lead the implementation of the priority actions and set up a system to monitor and evaluate progress. This system should include a monitoring structure that cascades responsibility to employees by linking actions to specific targets, a reporting structure that is transparent and builds accountability throughout the utility, and an incentive structure that motivates employees to meet their targets. The manager should clearly communicate the results achieved to all stakeholders.
4. **Gauge the readiness of the utility to move on** to phase 2.

The timeline for completing phase 1 will vary, depending on the commitments chosen. Ideally, phase 1 is completed in 6 months to a year. However, phase 1 may have to be repeated several times. Each time it is repeated, the space for change may expand to build additional credibility, but

not enough credibility to move on to phase 2. The utility will be ready to move on to phase 2 if it has the support of a government champion and a competent manager with a minimum level of autonomy, as well as the time, information, and financial resources required to develop an action plan.

Phase 2: Action Planning

The purpose of this phase is to develop and implement an action plan—based on systematic, coordinated, and prioritized actions aimed at providing quality service at a reasonable cost in a sustainable way. The action plan should be fully funded and specify multiyear targets.

Phase 2 consists of five steps, all led by the utility's management:

1. **Carry out a thorough baseline assessment** that provides an in-depth understanding of the utility's condition.
2. **Select priority, high-leverage actions for improvement** based on five guiding principles, possibly using the action matrices proposed by the framework.
3. **Prepare the action plan** by identifying indicators and multiyear targets for improving performance, estimating the cost of meeting those targets, and securing funding to cover those costs.
4. **Start undertaking activities set out in the action plan,** and adequately monitor and evaluate their progress. This M&E system should build on the system used during phase 1—elaborating the monitoring, reporting, and incentivizing structures. Targets should cascade from the utility level, to the department level, to the employee level; and employee performance reviews should include individual targets linked to key performance targets for the utility.
5. **Assess whether the utility is ready to proceed to phase 3.**

At the end of phase 2, the utility should be ready to transition to steady performance improvements. If the initial action plan does not deliver *continuous* improvement (that is, if the utility still suffers from systematic failures that put it at risk of backsliding to a vicious cycle), the utility should revise its action plan and adopt other measures until it achieves the required performance and maturity levels. Phase 2 may have to be repeated multiple times until the utility's management has sufficient resources, credibility, accountability, and decision-making autonomy to move on to phase 3.

Phase 3: Strategic Planning and Institutionalization

The final phase of the turnaround framework should help a water utility attain world-class performance status. It facilitates the switch from the *implementation of short-term measures* that fix the most glaring problems to *institutionalizing improvements* by engaging the utility's external environment, thereby continually improving operations and management.

To be able to reach world-class performance, the utility should have discernible levels of "good" maturity and performance at the beginning of phase 3. This means it should score at least a 3 on both performance and maturity,[5] and have the vision and ambition to aim for excellence. Moreover, it requires longer-term, higher-cost capital investments, and creating an external environment

that fosters successful performance. To that end, the utility should start advocating typical long-term interests of a successful utility: regulatory stability; integrated water resources management (IWRM) policies; financial sustainability; and deep and broad customer satisfaction.

In addition, the utility should develop a two-track strategic plan—one track focusing on improvements that solidify internal development and a second one focusing on stakeholder engagement and cooperation. A long-term vision (covering at least 15 years) should underlie this strategic plan. For most utilities starting in phase 3, achieving ambitious goals such as meeting the SDG for drinking water and sanitation (SDG 6) will demand significant time and resources.

To ensure that the long-term strategy is implemented, the utility should prepare 5-year business plans that segment the strategic plan—the heart of phase 3. In this phase, the utility's management should take the following steps:

1. **Assess** the effects of exogenous factors on the utility's long-term objectives
2. **Engage** stakeholders
3. **Choose actions** that support continuous internal development and help shape the utility's desired external environment
4. **Develop a strategic plan** (including financing needs and potential sources)
5. **Prepare a 5-year business plan** (derived from the strategic plan) and secure its funding
6. Set up a **performance management system**
7. **Implement the business plan** and secure finance to implement the strategic plan.

How the Turnaround Framework Is Useful for the World Bank

Empirical evidence shows that improving public water utilities is a long-term process (sometimes taking more than 10 years). The turnaround framework recognizes this by proposing a longer-term approach where some phases may even have to be repeated more than once. Applying the framework in its entirety may take longer than it typically takes to prepare and implement a World Bank-financed project.

The Turnaround Framework in Project Preparation

During project preparation, World Bank task teams can use the framework's tools to assess the utility and its environment; to identify priority actions to be financed; and to communicate key challenges faced by the entire sector or individual utilities to stakeholders.

The framework's assessment tools can be used—from the project's appraisal onward—to carry out a comprehensive, systematic, and standardized assessment of the utility. In addition, the phase 0 tools can be used to identify key obstacles to high performance. These hurdles should be communicated to external stakeholders, particularly government counterparts.

In addition, in conjunction with the results of the initial maturity matrix, the utility and the task team can use the action matrices developed for this framework to identify:

- High-priority, short-term actions that the utility could take during project preparation
- Actions that could be included in a project to be financed by the World Bank.

Finally, when preparing a sector-wide loan, a task team leader (TTL) can use the framework's tools to assess the performance and maturity of multiple water utilities in the country simultaneously. The results produced by these tools can be aggregated to identify common challenges faced by the utilities. With this information, the TTL can design a project proposing sector-wide interventions to address these challenges.

The Turnaround Framework in Project Implementation

During project implementation, the framework can inform the task team and the utility about actions needed to improve performance. At every stage of project implementation, the framework offers tools for a structured analysis of performance and maturity of the utility.

While a project is being implemented, the framework tools can be used for:

- Monitoring and evaluating the performance and development of the utility
- Identifying specific interventions that could support poorly performing projects
- Preparing follow-on lending projects.

The Turnaround Framework Can Help Develop a Knowledge Base on Improving Public Water Utilities

From a more general World Bank perspective, the standard use of the turnaround framework can greatly contribute to understanding how to improve the performance of water utilities. Once the framework tools are widely used (in collaboration with IBNET[6]), the World Bank will be able to track the performance and maturity levels (broken down by performance area) of utilities over time. It will provide information about how long it takes utilities to progress from one level of maturity to the next and the most effective actions to enable that progression.

Notes

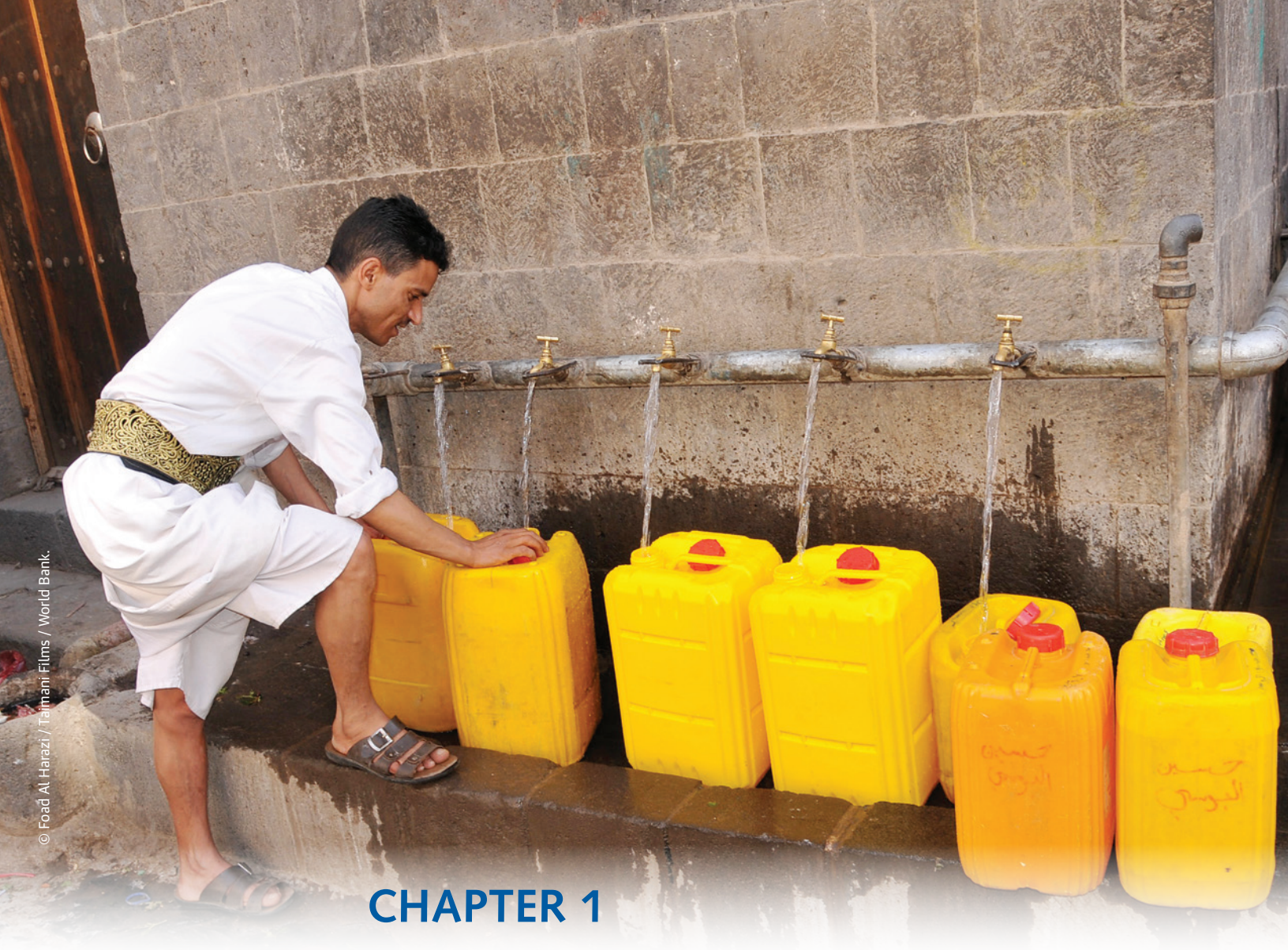
1. Adapted from the original definition in Heymans et al. (2016) to include the dimension "financially sustainable."
2. In this context, maturity regarding organization and strategy, human resource management, financial management, technical operations, and commercial operations.
3. Phase 0 was piloted in two water utilities—the Water Utilities Corporation (WUC) in Botswana and Can Tho Water Supply and Sewerage Joint Stock Company (Can Tho Wassco) in Vietnam—and revised to reflect the lessons learned from these pilots.
4. Phase 1 was also piloted at the Water Utilities Corporation (WUC) in Botswana and at Can Tho Water Supply and Sewerage Joint Stock Company (Can Tho Wassco) in Vietnam. It was subsequently revised to reflect best practices and strategies for choosing first commitments and monitoring implementation.
5. The turnaround framework rates performance and maturity on a scale of 5, ranging from 1 (elementary) to 5 (world-class).
6. The International Benchmarking Network for Water and Sanitation Utilities (IBNET) manages the world's largest database on performance data of water and sanitation utilities. It supports and promotes good benchmarking practice among WSS service providers by: (i) providing guidance on indicators and definitions; (ii) facilitating the establishment of national or regional benchmarking schemes; and (iii) conducting peer group performance comparisons.

ABBREVIATIONS

BNDES	Brazilian Development Bank
CAPEX	capital expenditure(s)
CESAN	Companhia Espírito Santense de Saneamento (water utility in Espírito Santo, Brazil)
DAC	Development Assistance Committee (of the OECD)
DANIDA	Danish International Development Agency
DAWACO	Da Nang Water Supply Company (Vietnam)
DSCR	debt service coverage ratio
EBITDA	earnings before interest, tax, depreciation, and amortization
ERP	enterprise resource planning
GIS	geographic information system
GNI	gross national income
GTZ	German Technical Cooperation Agency (now GIZ)
HR	human resources
HRM	human resource management
IDB	Inter-American Development Bank
IFRS	International Financial Reporting Standards
IT	information technology
IWA-WUEAM	International Water Association's Water Utility Efficiency Assessment Matrix
IWRM	integrated water resources management
LCU	local currency unit
MDGs	Millennium Development Goals
M&E	monitoring and evaluation
MIS	management information system
NRW	nonrevenue water
OCC	operating cost coverage
OECD	Organisation for Economic Co-operation and Development
O&M	operations and maintenance
ONEA	Office National de l'Eau et de l'Assainissement (national water utility in Burkina Faso)
OPEX	operating expenditures
PC	People's Committee of Can Tho (Cambodia)
PMO	Plan Maestro Optimizado (SEDAPAR's strategic plan)
PPP	public-private partnership

ROC	return on capital
SABESP	Companhia de Saneamento Básico do Estado de São Paulo (water utility of the state of São Paulo, Brazil)
SCADA	supervisory control and data acquisition
SDG	Sustainable Development Goal
SEDAPAR	Servicio de Agua Potable y Alcantarillado de Arequipa (Water utility in Arequipa, Peru)
SICAT	Sistema Integrado de Comercialização e Atendimento (CESAN's commercial and customer service integrated system)
SMART	specific, measurable, actionable, realistic, and time-bound
SOE	state-owned enterprise
SONEB	Société Nationale des Eaux du Bénin (National water utility in Benin)
SUNASS	Superintendencia Nacional de Servicios de Saneamiento (water sector regulator in Peru)
TTL	task team leader
UNICEF	United Nations Children's Fund
USP	utility support partnership
VEI	Vitens-Evides International
WHO	World Health Organization
WSS	water supply and sanitation
WUC	Water Utilities Corporation (Botswana)

All dollar amounts are U.S. dollars unless otherwise indicated.



© Foad Al Harazi / Talmani Films / World Bank.

CHAPTER 1
Introduction

In many urban areas around the world, public utilities provide water supply and sanitation (WSS) services. While some of these urban public water and sanitation utilities ("water utilities") perform well, others suffer from the types of performance issues observed in many public sector entities, such as low operating and investment efficiency. The World Bank is promoting a three-pronged approach to enhance water utilities' performance: (i) strengthening the operational efficiency of the utility; (ii) improving the governing environment; and (iii) improving access to funding for WSS. This approach lies at the core of the water utility turnaround framework, elaborated in this report.

This report draws on empirical evidence from case studies of successful and unsuccessful turnarounds. While it may contribute to the analytical literature on utility turnarounds, its main purpose is to identify critical elements for, and provide a step-by-step approach to, starting and sustaining improvements in the performance of water utilities (Kolker 2017).

The turnaround framework can be adjusted to the specific condition of a utility and the context in which it operates. It recognizes that capital investments may be essential for a utility

to increase access to its WSS services, the quality of service, and operational efficiency. However, those investments will be more efficient and effective if the utility's *internal capacity* is first strengthened. Implementing certain measures, together with more efficient and effective capital investments, is essential to achieving the Sustainable Development Goals (SDGs) for WSS.

1.1 Background

Despite large investments in the WSS sector by governments and their development partners over the last 10–15 years, the sustainable delivery of WSS services in developing and emerging economies has not significantly improved. Why do so many water utilities continue struggling to improve service sustainably? What has been the impact of these interventions and what condition is the WSS sector in? These are some of the things we know:

- Significant segments of the population in virtually all developing and emerging economies receive fewer WSS services than they would like to receive and often also than they are willing to pay for.
- Improving the performance of water utilities is difficult because the issues affecting their performance are complex and multidimensional.
- The infrastructure funding gap in the WSS sector (to achieve the SDG targets) is huge—estimates ranging from $74 billion to $166 billion annually, which represents more than three times the amount historically invested in the sector (Hutton and Varughese 2016).
- The WSS sector has historically relied on public sector financing for its investment needs. However, governments and development agencies have insufficient funds to meet the sector's expected investment requirements (Kolker et al. 2016).
- While the need to attract *commercial* financing to help close the infrastructure funding gap is clear, the commercial financiers have been reluctant to invest in the water sector because they perceive the risks of investments in the WSS sector to be higher than those of other sectors and more difficult to manage (Bender 2017).

While recent efforts have not produced the performance improvements that had been anticipated and are necessary, we have learned that governments must take a holistic approach to the complex issues affecting the sector. Governments and their development partners must tackle the sector's institutional and governance shortcomings, while also addressing the utilities' operational performance issues. Further, governments must address the concerns of domestic financiers and raise utilities' creditworthiness to attract commercial financing.

Given the nature of the WSS sector, improving its performance will be neither quick nor easy. However, the integrated approach presented here will ultimately facilitate utilities' access to public and commercial finance. And water utilities with access to commercial finance are much more likely to achieve the SDGs. Yet for governments to attract commercial finance to expand utilities' service coverage and provide the services necessary to meet the needs of the communities, they must first address the technical and financial inefficiency of water utilities and the sector's larger governance and institutional issues. Thus, improving the performance of a given

utility combined with strengthening the institutional, policy, and regulatory aspects of the WSS sector lay the foundation for that utility's access to finance (figure 1.1).

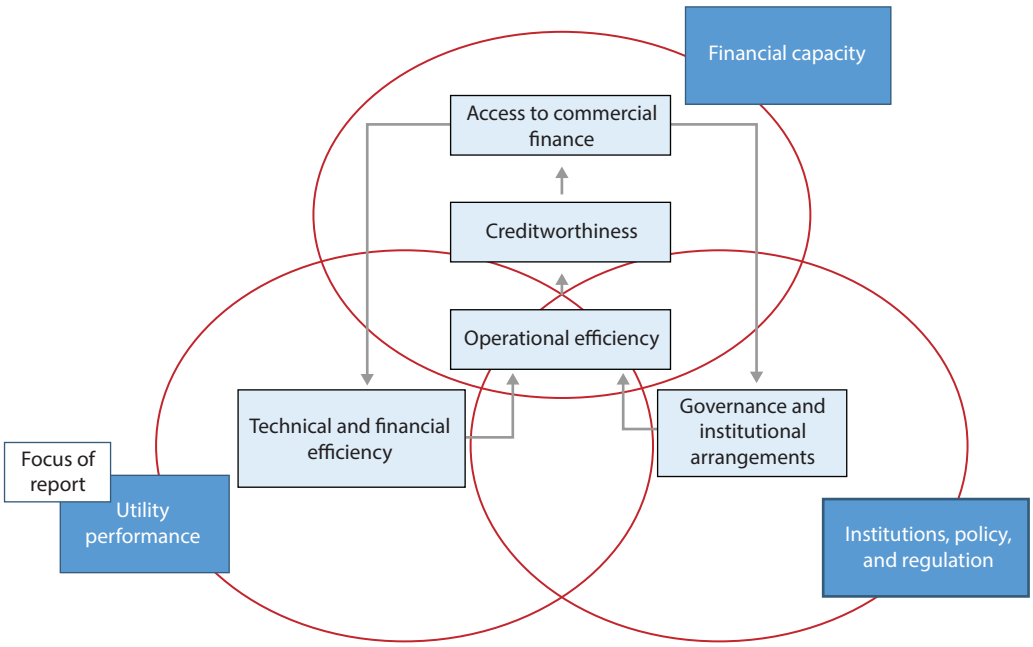
The Bank has taken the lead in applying this holistic approach and recently completed a series of studies designed to capture lessons learned and develop a comprehensive framework to help governments meet their SDG water targets. The relevant studies are: (i) *Introducing Commercial Financing into the Water Sector in Developing Countries* (Bender 2017); (ii) *Financing Options for the 2030 Water Agenda* (Kolker et al. 2016); (iii) *Crowding-In Commercial Finance in World Bank Water and Sanitation Operations - A How-To Guide for World Bank Task Teams* (World Bank 2017); and (iv) *Aligning Institutions and Incentives for Sustainable Water Supply and Sanitation Services* (Mumssen, Saltiel, and Kingdom 2018).

In general, these studies concluded that there is no one-size-fits-all solution for the performance problems of the WSS sector. However, they also concluded that the actions taken by countries and utilities that did manage to improve their utilities' performance tended to implement the same key actions in roughly the same order. The main takeaways from the case studies reviewed are presented below, grouped by major performance area.

Institutional, Policy, and Regulation (Mumssen, Saltiel, and Kingdom 2018, xv)

- Technical solutions alone are unsustainable. For reform measures to endure, positive incentives need to be embedded in policy, institutional, and regulatory structures;
- Individual policy, institutional, and regulatory interventions must be aligned to ensure sustainability, as misalignment leads to distortion of incentives; and

FIGURE 1.1. The Cycle of Improved WSS Sector Performance



Source: Adapted from Kolker 2017.

- Changes in institutional arrangements and the regulatory framework need to be supported by laws and policies to be effective and sustainable.

Utility Performance

- In most cases, utilities established a baseline in the early stages of the turnaround as a key input for their business plan;
- Utilities under severe financial distress tended to focus first on achieving financial sustainability by either increasing revenues or reducing costs. Next, they set objectives through multiyear targets incorporated into sustainable business plans;
- In almost all cases, the first actions in their business plan involved improving human resource and management information systems (MISs); and
- In almost all cases, performance contracts were signed with the government at some point during the turnaround. These agreements helped define the utility's expected performance and the support to be provided by the government to achieve it.

Commercial Financing (Bender 2017)

- To successfully attract commercial financing to the WSS sector, the requirements and concerns of potential lenders—including their perception of the risks of lending to the water sector because of the politically sensitive nature of water—must also be addressed;
- A creditworthy utility is both able and willing to service all its debt obligations in time from the cash flow generated through its operations;
- While the capital investment requirements of the sector cannot be met by the public funds available, the latter can be leveraged to attract commercial finance by mitigating the lenders' perceived risks; and
- The World Bank and other development partners can help attract commercial finance in several ways, among others, by (i) providing output-based aid, (ii) providing partial credit guarantees, and (iii) blending their concessional financing with the more expensive commercial finance to make the larger financing package affordable to the borrower.

The Bank's three-pronged approach draws on past initiatives that succeeded in improving the sustainable delivery of WSS services by financing large investment programs and offering a range of promising technical solutions. However, in most cases, these initiatives proved to be unsustainable. New thinking is clearly needed. While this new thinking should still include the economics of investments in infrastructure, it should also include an understanding of political economy, and behavioral and institutional economics. Moreover, it needs to be grounded in countries' different contextual realities, drawing lessons from approaches that were successful or failed to achieve specific objectives (Mumssen, Saltiel, and Kingdom 2018, ix).

While (central and local) governments must be supported in addressing critical policy, institutional, and regulatory interventions, it is also important to provide support at the utility level—aimed at strengthening the management's capacity to improve a utility's performance and overall level of operating efficiency. To this end, the turnaround framework has developed tools to guide poorly performing water utilities keen to improve their performance.

Utility Performance: The Focus of this Report

The turnaround framework emphasizes the actions that management can take, without any government intervention, to improve a utility's performance. One possible action is to reorient the "mindset" of the utility away from managing assets for the production of water, to one that is centered on its customers and attempts to adjust its operations to best address their needs. As the services provided improve—raising *credibility* with customers and stakeholders—and utility management and staff are held *accountable* for the results, the entities responsible for policy and oversight will be willing to grant the utility in question more *autonomy*.

Furthermore, as the utility's performance improves, it can be expected to start generating a positive cash flow through its operations, which can be used to finance small capital projects or to service commercial loans. As the utilities gain creditworthiness, governments and their development partners have numerous tools available—as part of the City Creditworthiness Initiative[1]—to both further improve the utility's performance and work with commercial financiers to address their qualms about increasing lending to the water sector. Governments must understand the risks that the financiers perceive in the water sector and begin to take actions to mitigate those risks. With World Bank support, governments can make use of public funding to reduce some of the perceived risks and thereby attract commercial financing; output-based aid programs and partial risk guarantees, among other things, can be used to crowd in commercial financing.

Finally, as utilities' performance improves and some of the better performing utilities begin to attract local commercial financing, governments will feel growing pressure to further improve their policies, institutions, and regulations. And as the utilities' credibility continues to grow and management and staff increase their level of accountability and financial performance, governments will be more inclined to raise the level of managerial autonomy, in turn boosting the sector's overall performance.

A framework for turning around poorly performing water utilities will benefit the management of these utilities, governments with responsibilities for water utilities, and those providing technical and financial support to the WSS sector. If water utilities manage to sustain a successful turnaround, billions of people will gain access to safely managed WSS services.

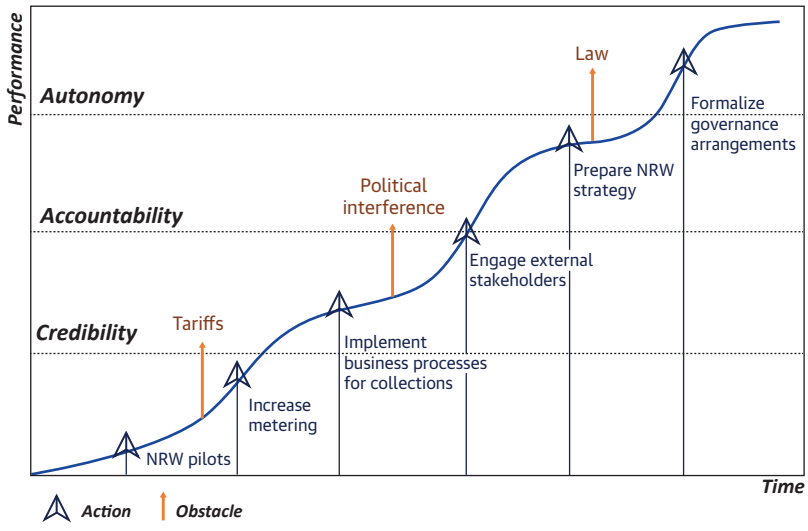
Improving the performance of water utilities is difficult because the problems that they face are complex and multidimensional. Problems caused by dysfunctional political environments, combined with an entrenched backlog of inefficient practices, cannot be solved simply by applying standard technical and managerial techniques. *Sustaining* a turnaround requires a framework that integrates practical steps to increase a water utility's operational and managerial efficiency with measures to reverse the dysfunctional political equilibrium in which it operates. Ultimately, a utility must have a competent manager[2] to guide utility staff and make critical changes. Dedicated leadership is essential to identify early gains that build credibility and instill confidence in staff that a turnaround is possible.

While the framework focuses on strengthening the management and operational efficiency of water utilities, to be effective, it must also address broader challenges:

- Compared to private water utilities, the governing framework of public water utilities typically provides weaker incentives and introduces barriers to providing good service—maintaining low water tariffs, even if such tariffs undermine service delivery; appointing and replacing water utility managers on political grounds; putting constraints on staff compensation, etc.
- Poorly performing water utilities will most likely have to begin a turnaround without a supportive governing framework, and without the funding required to make significant (infrastructure) improvements. Such utilities need to first increase their credibility and autonomy by making the best possible use of the space for change and resources available. Evidence from turnarounds shows that this is only possible with a government champion or a competent utility manager with a minimum level of autonomy. While these individuals cannot bring about change on their own, they can be successful by developing the necessary solutions, building alliances, and galvanizing others to work with them.

Figure 1.2 illustrates the complexity and interdependencies of a turnaround path for a water utility. At the beginning, the utility will typically have very low credibility, accountability, and autonomy. It will therefore first have to take a series of prioritized and well-sequenced actions to increase operational and managerial capacity (for which precise models rarely exist). Along this path, the utility may encounter obstacles that can only be removed or mitigated by other entities. For example, the utility may need an increase in tariffs to improve its access to financing for essential capital investments. Yet the utility will have to deliver on commitments that increase its credibility before it can gain support for those tariff adjustments.

FIGURE 1.2. Sample Path from Poor Performance to Turnaround to Sustainability



Source: Gerard Soppe, conversations with Castalia, March 28, 2017.
Note: NRW = nonrevenue water.

1.2 Structure of the Report

This report combines the managerial and technical strategies used by the management of successful water utilities with a practical guide to overcoming the complexities and interdependencies of a turnaround path. It is divided into two parts: (i) the analytical basis of water utility turnarounds and (ii) a practical approach to turning around a utility.

The analytical basis is set out in chapters 2 and 3. Chapter 2 discusses the challenges of turning around a utility and describes the need for a systematic, coordinated, and prioritized approach to do so successfully. Chapter 3 introduces the utilities that were studied to inform the turnaround framework. It presents the empirical evidence gathered from the five utilities reviewed and the complementary findings from 15 utilities analyzed in previous studies.

The practical approach is elaborated in chapter 4, which introduces the turnaround framework and discusses its four phases in detail. It also presents the tools developed specifically to facilitate the application of the framework to a given utility.

The appendices give more background information on the case studies and framework elements that form the cornerstones of this report. A glossary of water utility management terms is included in the back matter.

Notes

1. The World Bank's City Creditworthiness Initiative helps cities improve their financial performance and secure the private investment they need to fund climate-smart infrastructure and services.
2. A competent manager is entrepreneurial and astute, capable of planning for improvements to provide successful service, and capable of delivering on them. The ability to secure a competent manager will depend on government agents outside the water utility (section 3.2).

PART I

ANALYTICAL FOUNDATION OF THE WATER UTILITY TURNAROUND FRAMEWORK

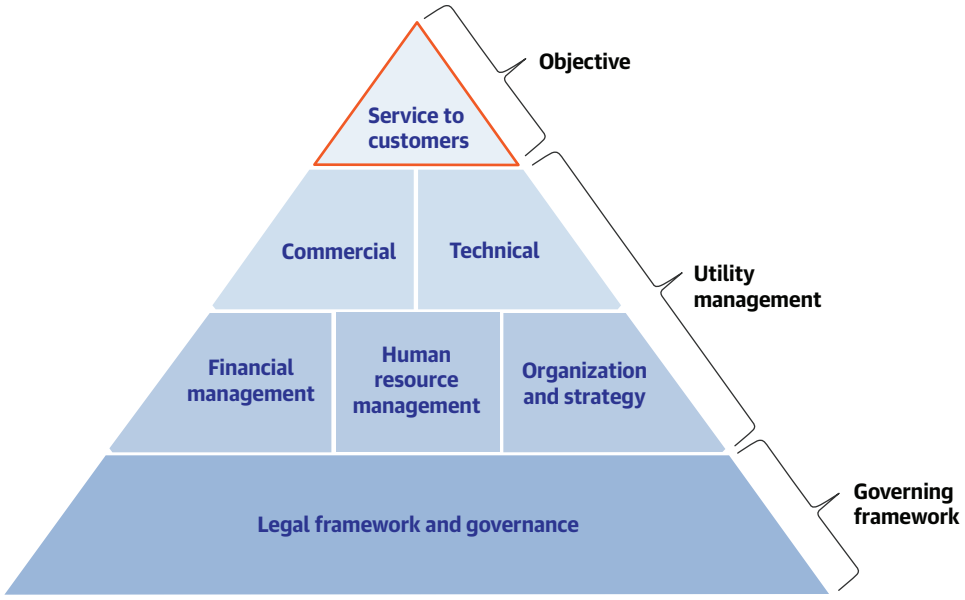
CHAPTER 2
The Need for a Turnaround Framework

What does the public want from its water utilities? The answer is simple: sufficient, reliable, convenient, and safe water services. Water provision should be transparent, financially sustainable, and responsive to citizens.[1] Wastewater should be collected, treated and discharged properly. The measures needed to improve the operational and managerial capacity of water utilities are generally straightforward—for instance, information is readily available on how to efficiently procure and build water treatment plants, and how to install meters.

Yet, although many utilities are performing well, over half a billion people around the world still lack access to safe drinking water. The SDGs go beyond access to safe drinking water and require equitable access to safely managed and affordable drinking water for all.

This chapter discusses the drivers of good utility management and an effective governing environment (figure 2.1) and explains the need for a comprehensive turnaround framework. The success pyramid illustrates the interdependencies and complexities for water utilities trying to achieve sustained high levels of performance.

FIGURE 2.1. Success Pyramid



Source: Adapted from Heymans et al. 2016.

Service to customers clearly depends on technical and commercial operations, but not exclusively so. Other elements of sound utility management are organization and strategy, human resource management (HRM), and financial management. Together, these promote effective and efficient commercial and technical operations—for instance, by increasing staff productivity and reducing water losses. The legal framework and governance in which the utility operates shapes its governing environment. Understanding the interactions and relations between the layers of the pyramid is important for developing and implementing a successful turnaround.

Section 2.1 discusses the performance of water utilities, while section 2.2 examines the role of the political economy. Section 2.3 discusses how vicious cycles of political economy are aggravated by the lack and inefficient use of funding for achieving WSS sector objectives.

Performance will not improve unless the vicious cycles in which water utilities operate are broken. The challenge is to coordinate turnaround actions so that utilities can deliver better services, sustainably and at an affordable cost. To accomplish this, water utilities need a systematic, coordinated, and prioritized approach to improve their operational and management capacities, while mitigating the negative impacts that the political environment may have on their performance (section 2.4).

2.1 Water Utilities' Poor Performance, Despite Interventions

While several success stories are well publicized, many water utilities struggle to deliver water safely, conveniently, and reliably. Today, over 660 million people lack access to safe drinking water, 157 million of whom live in urban areas. Over 159 million people use surface water to

survive, risking water-borne illnesses that are often fatal (UNICEF and WHO 2015, 11). Almost one infant death in five is due to water-borne illnesses (UNICEF and WHO 2009). Approximately 2.4 billion people lack access to sanitation, with over 700 million of them living in urban areas. Also, 946 million people defecate openly, 78 million of whom do so in urban areas (UNICEF and WHO 2015, 16).

In some regions, access to drinking water has decreased over time on a percentage basis. In Sub-Saharan Africa, 43 percent of the urban population had water piped to their premises in 1990. This had dropped to 33 percent by 2015, because water utilities could not keep up with population growth and rapid urbanization (Heymans et al. 2016, 1). The same goes for parts of Southeast Asia, Latin America, and the Caribbean.

Many water utilities have continued to perform poorly despite countless interventions. Donors have invested billions to improve water utility performance in developing countries. Donor funds support lending (and some grants) for capital investments, institutional reform, and technical assistance. For example, the OECD Development Assistance Committee (DAC) members committed $10.6 billion between 2001 and 2006 (OECD/DAC Secretariat and the World Water Council 2008). The World Bank alone approved over $16.9 billion in WSS projects between 2009 and 2013 (World Bank 2014).

While past interventions incidentally did help improve governing environments and utility management, many water utilities continue struggling to improve service sustainably. To a large extent, this is because interventions failed to adequately address the political economy in which water utilities operate. Understanding the political economy requires thorough mapping of and engaging with relevant stakeholders. An effective approach therefore involves addressing both the utility's performance and its governing environment.

2.2 The Dysfunctional Political Economy Trap

The political economies of poorly performing water utilities are often dysfunctional and perpetuate vicious cycles that sustain poor performance. As these vicious cycles worsen, water utilities are increasingly hindered by their low credibility, little to no accountability, and limited autonomy (section 2.2.1). Utility managers must therefore develop virtuous cycles that counteract the vicious ones and build the credibility, accountability, and autonomy required to perform successfully (section 2.2.2).

2.2.1 Characteristics of Dysfunctional Political Economies

In dysfunctional political economy settings, water utilities operate for purposes other than serving customers. These purposes can include helping government authorities secure votes by providing jobs, or by promising water services to low-income customers at tariff levels below cost. In some cases, politicians use water utilities for personal gain. As such political interference benefits government authorities, it is difficult to stop.

When dysfunctions become the norm, vicious cycles that cripple performance develop inside the utility. This typically leaves managers with limited decision-making autonomy—in matters

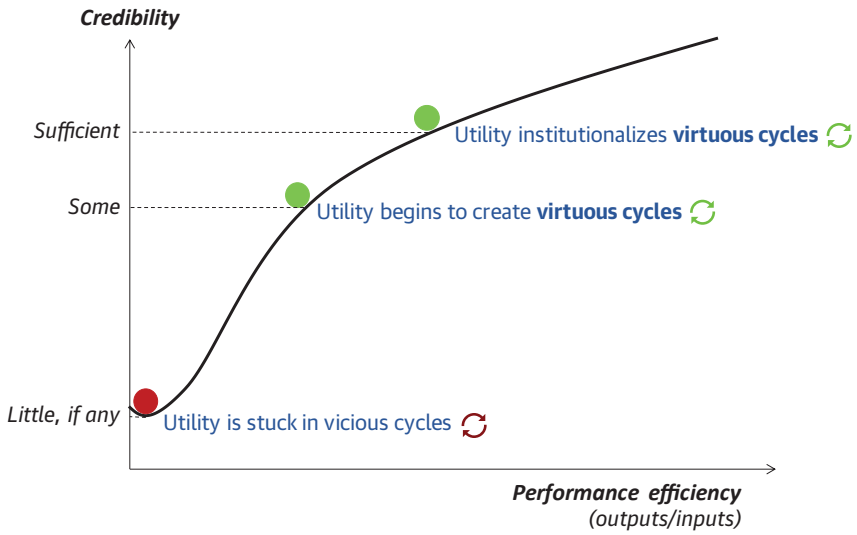
such as the allocation of resources for operations, hiring and firing staff, and the selection of capital investment projects. Setting and meeting targets is unlikely against this background. Under weak management, staff become apathetic and unmotivated. Absenteeism and tardiness can become the norm. Meter readers may start to accept kickbacks and management may hire staff in exchange for political favors. The utility's operations become inefficient and poor-quality service is the result. Governments transfer funds without regard to performance, effectively compensating utilities for inefficiencies and perpetuating the vicious cycles (Muller, Simpson, and van Ginneken 2008).

Under these circumstances, customers may lose confidence in the utility's ability to improve services. As this situation persists, water utilities become less accountable to customers, and customers start questioning their utility charges. A downward cycle results, as water utilities are even unable to charge rates that merely cover their operating expenditures. This in turn leads to service quality deteriorating further, credibility with customers declining, and customers becoming accustomed to poor service and unwilling to continue paying for it. Customers may opt for an alternative "solution"—such as water tanks or drinking-water trucks. This further undermines the viability of the water utility and makes any turnaround more difficult.

2.2.2 Transforming Political Economy Dynamics to Start a Turnaround

Turning around a water utility's performance requires transforming the dysfunctional political economy. Doing so entails developing virtuous cycles that stop downward spirals and create the credibility, accountability, and autonomy—or at least space for reform—required to perform successfully. Figure 2.2 illustrates in generic terms the transformation that a utility undergoes during the process. Initially, the water utility is stuck in vicious cycles and marked by little or no credibility. As a utility manager starts acting to improve performance, credibility is likely to

FIGURE 2.2. Turning Around a Water Utility



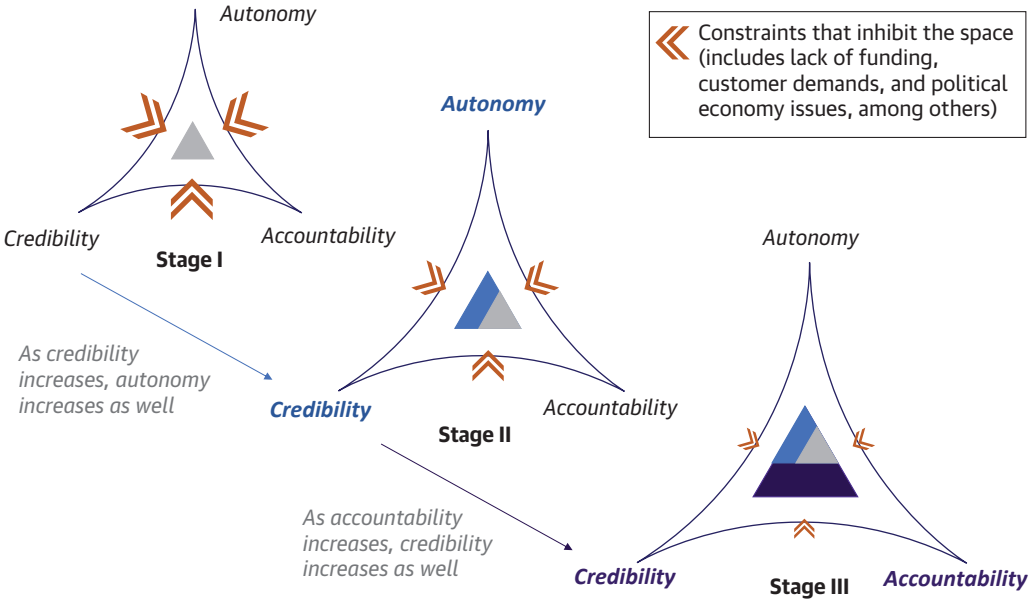
increase. These actions expand the space for reform and start to create virtuous cycles. As these cycles are institutionalized, credibility increases further so that the government, customers, and other stakeholders become more supportive of measures to perform successfully in the long term.

Turning around a utility's performance rarely is a linear process. Considerable tactical acumen is needed to mobilize political leadership, motivate staff, and overcome entrenched negative behavior and incentives, while gradually building public support and credibility among customers. To start undertaking actions that improve performance, utility managers must maneuver within their space for change.[2] Because credibility at this point is generally low, the initial space for change is usually limited, as is the manager's autonomy.

Figure 2.3 illustrates how managers' autonomy to make changes increases as their credibility grows. Stage I represents the beginning of a turnaround, when managers have minimal autonomy, and little to no credibility and accountability. Having a minimum of autonomy is important because it allows the utility manager to make decisions and use resources to improve performance. To begin expanding the space for change, managers need to increase shareholder, government, and customer confidence in the water utility's ability to perform. Managers accomplish this by making clear commitments—for example, to reduce accounts receivables in a short period—and consistently delivering on them.

As credibility grows, managers gain more autonomy to make decisions, and often also access to the capital needed for infrastructure investments. At stage II, managers have built so much credibility that stakeholders are willing to provide resources, provided they can hold managers accountable. As managers deliver on commitments tied to funding, accountability grows and with it, the space for change. At stage III, managers have delivered on enough commitments to secure significant credibility, accountability, and autonomy from stakeholders.

FIGURE 2.3. Increasing the Space for Change

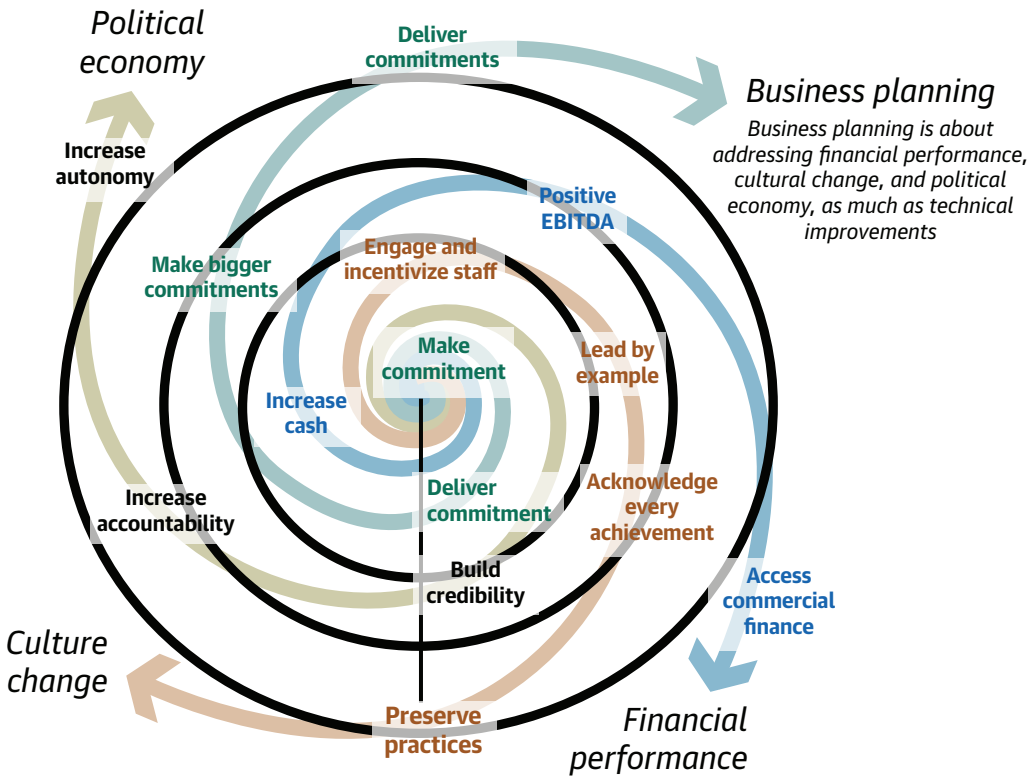


The actions that managers use to build credibility, accountability, and autonomy are crucial to creating virtuous cycles, as illustrated in figure 2.4. At the beginning of the spiral, all lines are tight because the space for change to maneuver is limited. Yet once a manager commits to change, virtuous cycles that improve financial performance (such as increasing cash) and corporate culture start developing. This in turn increases credibility with stakeholders as well as customers' willingness to pay, and boosts staff morale, laying the basis for the turnaround. As credibility, accountability, and autonomy increase further, the manager can continue implementing actions, reinforcing the development of virtuous cycles.

The case studies of successful turnarounds show that managers can be held accountable and given the necessary autonomy to kick off the reform process (Muller, Simpson, and van Ginneken 2008, 6). Rules, customs, standards, and systems can collectively guide managers in delivering and reporting on results and be held accountable.

As mentioned, these processes are rarely straightforward and neatly sequenced. Winning political and staff support, galvanizing coalitions of stakeholders, and sustaining the momentum of reform are arduous tasks that invariably involve setbacks and meet with resistance. It is important to thoroughly understand the vicious cycles that affect the utility and use the limited space for change creatively. Utility turnarounds are ultimately contextual. While the conceptual framework described here captures the essence of turnaround processes, reform

FIGURE 2.4. Creating Virtuous Cycles to Improve Performance



Note: EBITDA = earnings before interest, tax, depreciation, and amortization.

cannot be reduced to a science. Dedicated and strong leadership is required, as well as taking advantage of every available opportunity to break out of the vicious cycles holding back performance.

2.3 Inappropriate Model for Funding Water Utilities

Many water utilities operate in a political economy disequilibrium that contributes to the inefficient use of the funds available to the sector and aggravates the lack of access to commercial finance. In fact, current funding models will be unable to provide the money needed for investments to meet the water-related SDGs.[3]

Poorly performing water utilities waste much of their available funding on inefficient operations and poorly planned and executed capital investments. As a result, providers of capital are reluctant to commit resources. To counter this, the World Bank is developing a model that focuses on more efficient use of existing funding; better use of domestic funds; and leveraging concessional finance to attract more private finance to the sector (Kolker 2017).

The starting point for the Bank's proposed model is a more effective use of available funds—at the start of the turnaround—by making water utilities' operations and capital investments more efficient. Higher efficiency will encourage governments to put more resources into the sector, while also creating space for private lenders to substantially raise the level of financing they provide. This means that water utilities will typically need to increase their operating and investment efficiency *before* they can secure funding and financing for investments aimed at increasing their operational efficiency and service quality and expanding WSS coverage.

Once water utilities start using existing resources more effectively, their operating efficiency and credibility will increase. By combining increased operational efficiency with an improved governing environment, utilities gain greater accountability and autonomy. Over time, water utilities will achieve enough credibility and accountability to access *commercial* finance. The latter reinforces the sustainability of water utilities by instilling greater discipline, thereby ensuring better financial planning and more effective capital investment plans.

2.4 Insufficient Operational and Managerial Capacity

For a turnaround to succeed, it is critical to sequence and coordinate the steps taken to improve the operational and managerial capacity of water utilities, while remaining flexible enough to deal with unpredictable events. The actions required at different maturity levels of a utility are generally well known. For example, installing water meters, updating the customer database, implementing a new billing and collection system, and using a geographic information system (GIS) to map underground water pipes are all actions that will improve technical and commercial performance. However, if these actions are not properly sequenced and coordinated—as part of an overarching strategy—they won't improve a water utility's operational and managerial capacity.

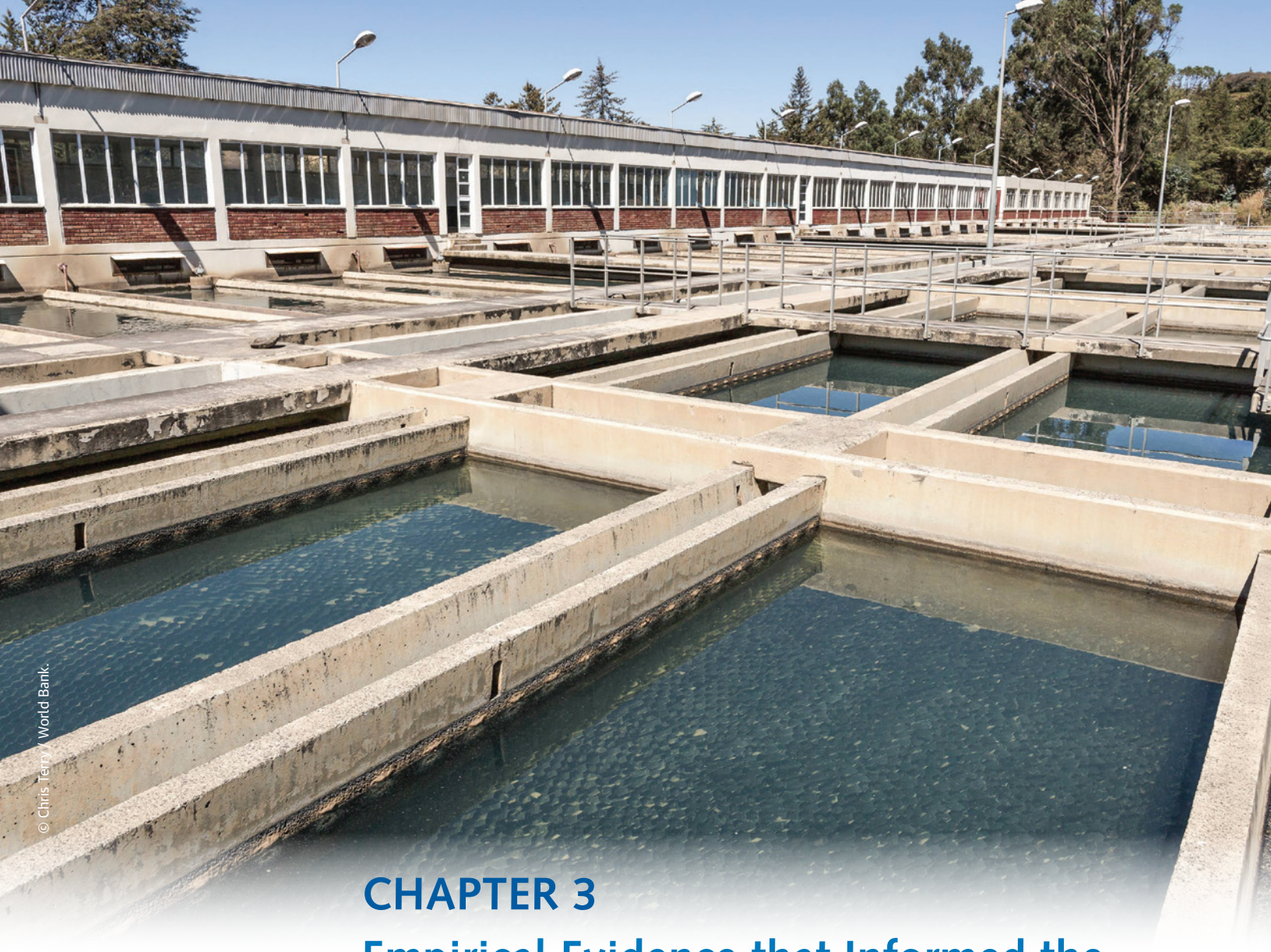
The operational and managerial capacity of a water utility depends on the degree to which the areas of human resources, finances, and organization and strategy, are integrated with

technical and commercial operations. The degree of integration is in turn linked to the maturity level of each performance area.[4] A minimal level of coordination would ensure that the customer database is linked to the billing and collection system, and that the GIS not only maps the pipes but also the location of every customer and every meter. The three systems would then reinforce each other to optimize commercial and technical operations. Unfortunately, integration and coordination are often absent in poorly performing water utilities.

Many interventions have found it challenging to properly sequence and coordinate actions. For instance, donors invested about $300 million in water supply systems across Sub-Saharan Africa that were later judged dysfunctional. This issue was attributed to low capacity, poor performance, and a weak governing environment, among other things (Kayaga, Mugabi, and Kingdom 2013, 17). While these investments were probably necessary to improve service, they were unsuccessful because actions had not been sequenced in a way that improved operational and managerial capacity. Analyzing successful sequences and coordination strategies, balanced with tactical pragmatism, offers invaluable insights for a turnaround framework.

Notes

1. Adapted from the original definition in Heymans et al. (2016) to include the dimension "financially sustainable."
2. In their studies, Andrews et al. mention that "the basic approach [for improving the space for change] begins with recognizing that most deconstructed problems take the form of meta-problems"—that is, problems have many dimensions that make up an even larger problem. Because of this, Andrews et al. state that solving meta-problems requires multiple interventions. This in turn offers different opportunities for change. This space for change is "contingent on contextual factors commonly found to influence policy and reform success, shaping how much one can do through any policy or reform initiative at any time" (Andrews, Pritchett, and Woolcock 2017, 158).
3. As previously mentioned, extending universal access to water supply and sanitation alone will cost an estimated $144 billion per year, more than three times the estimated current annual investment of $34 billion (Kolker 2017, 5.)
4. The turnaround framework rates performance and maturity on a scale of 5—ranging from 1 (elementary) to 5 (world-class). More details are given in section 3.3.



CHAPTER 3
Empirical Evidence that Informed the Turnaround Framework

Water utilities worldwide have attempted to improve performance by taking actions to break vicious cycles that prevent sustainable change. The practical guidelines for underperforming utilities derived from analyzing these experiences are reflected in the turnaround framework.

Five case studies yielded an in-depth understanding of the actions taken to improve performance. Additional case studies from earlier studies enabled data to be compared and augmented the findings (section 3.1). This approach provided valuable empirical data on the decisions, actions, and external conditions that allow a poorly performing water utility to transform into a successful one. These data provided the foundation for the turnaround framework.

The data suggest that specific conditions should exist before embarking on a turnaround path (section 3.2). In fact, performance started showing improvement while utilities were taking steps that contributed to performance and capacity (section 3.3). Though context and duration varied, successful turnarounds show broadly similar pathways, marked by similar milestones (section 3.4).

3.1 Sources of Empirical Evidence

The turnaround framework draws on empirical evidence from water utilities that attempted to improve performance. The utilities studied for this study operate in countries with different income levels and environments. Primary data were collected from the following turnaround cases: CESAN (Brazil) and SEDAPAR (Peru) in South America, ONEA (Burkina Faso) and SONEB (Benin) in Sub-Saharan Africa, and DAWACO (Vietnam) in Southeast Asia (section 3.1.1). SEDAPAR was the only utility that failed to sustain the improvements achieved during its turnaround period.

Previous studies on water utility performance—specifically Baietti, Kingdom, and van Ginneken (2006); Heymans et al. (2016); and Engelsman and Leushuis (2016)—augmented the findings for the turnaround case studies (section 3.1.2). In all, these studies analyzed 15 water utilities worldwide (Map 3.1) to pinpoint the factors behind their successful turnaround or performance (sections 3.2 and 3.3 respectively). All case studies are briefly discussed in the remainder of this section and elaborated in appendix D and E.

3.1.1 Turnaround Case Studies

Five turnaround cases were studied to gain an in-depth understanding of their approach to improving performance.[1] The utilities have different institutional models and decentralization levels and operate in countries with varying income levels. Some utilities are government-owned, while others have mixed ownership. One utility operates at the municipal

MAP 3.1. Turnaround Case Studies and Other Relevant Water Sector Studies

Source: Baietti, Kingdom, and van Ginneken 2006; Heymans et al. 2016; Engelsman and Leushuis 2016 (Rebel Group).

level, and the rest operate at the state, regional, or national level. All utilities are in middle- or low-income countries. Four of the five utilities experienced successful turnarounds. Each case is summarized below and elaborated in appendix D.

- **Companhia Espírito Santense de Saneamento (CESAN).** CESAN experienced a successful turnaround between 2003 and 2011. CESAN provides water and wastewater services to Espírito Santo, a state of about 4 million people in southeastern Brazil (Brazilian Institute of Geography and Statistics 2015). Between 1996 and 2002, CESAN was held captive to political interests and generating financial losses.[2] Despite facing water shortage issues, CESAN did not have systems or plans for improvements. In 2003, backed by a government champion and under the leadership of a new, talented manager, the company embarked on a concerted effort to turn around the utility. Within 9 months, CESAN was generating profits. It achieved a turnaround by developing financial discipline, implementing well-designed strategic plans, and establishing effective human resource, management, and IT systems. The turnaround was sustained thanks to the utility's managerial autonomy, forward-thinking approach to strategic planning, and institutionalization of efficient processes.
- **Da Nang Water Supply Company (DAWACO).** DAWACO experienced a successful turnaround between 2007 and 2010. It provides water services to Da Nang, a city of approximately 1 million people in central Vietnam. Before 2007, DAWACO struggled with low service provision and high levels of nonrevenue water (NRW). In 2005, the government began implementing significant reforms for state-owned enterprises (SOEs) and the water sector. The government supported DAWACO during these reforms, ultimately leading it to enter into a utility support partnership (USP) to improve its performance. DAWACO's private partner in the USP, Vitens-Evides International (VEI), helped to develop a strategic plan; build employee capacity; implement MISs; and promote local ownership of the turnaround process. DAWACO has successfully maintained its turnaround since the USP ended in 2010, largely thanks to the change in corporate culture. By emphasizing trust, local ownership, and capacity building in the USP, DAWACO ensured its success would be long-lasting.
- **Office National de l'Eau et de l'Assainissement (ONEA).** ONEA experienced a successful turnaround between 1996 and 2007. It provides water and wastewater services to urban and semi-urban areas throughout Burkina Faso, serving approximately 3.7 million people.[3] Before 1995, ONEA faced waves of privatization, socialist policies, and the separation of water and sanitation sectors. The constant reorganizing, political interference, and inadequate service provision undermined the utility. Severe water shortages further aggravated ONEA's poor performance. ONEA began its turnaround in 1996, led largely by a newly appointed government champion and a skilled manager. It focused efforts on increasing its water capacity and service provision. The utility strove to improve its commercial operations and financial sustainability with a private partner. It also focused on increasing service delivery to the poor. These steps were key to increasing coverage and company revenue. Today, ONEA continues to face many challenges, among others, expanding sanitation coverage. Even so, ONEA's ability to institutionalize managerial autonomy, capacity building, and innovation suggest a positive prognosis for sustaining the momentum of its improvements.

- **Société Nationale des Eaux du Bénin (SONEB).** SONEB has continuously improved its performance since its creation in 2003 and is poised to succeed at turning around its performance. SONEB provides water and some wastewater services to urban areas of Benin, a country of approximately 10.9 million people (World Bank 2016). From its inception, SONEB endeavored to become more efficient and competitive than its poorly performing predecessor.[4] The government supported SONEB by making the water sector a national priority and enabling it to take measures that improved performance. SONEB focused on creating a qualified, competent workforce; implementing a tariff structure that supported its financial performance; and developing a business plan and financial model. It also established a contractual relationship with the government that allowed it to properly monitor performance and procedures. Today, SONEB's performance indicators continue to improve. This suggests that SONEB's turnaround will be sustained.

By contrast, one water utility's turnaround was unsuccessful. Though it achieved improvements in the early stages of the turnaround, it was unable to sustain them:

- **Servicio de Agua Potable y Alcantarillado de Arequipa (SEDAPAR).** SEDAPAR's performance improved between 2007 and 2010. The utility provides water and wastewater services to Arequipa, a region in southwestern Peru where 1.3 million people live. SEDAPAR is a public limited company whose shares are owned by the 33 municipalities in the Arequipa region. This governance arrangement made possible political interference in the utility's management. In 2007, with support from the regulator's new general manager, SEDAPAR's newly elected president prepared a multiannual strategic plan that tied tariff increases to performance. The strategic plan limited political interference by municipal shareholders and allowed SEDAPAR to increase its tariffs. The company also developed other performance targets and engaged the private sector to help develop key infrastructure projects. Performance peaked in 2010 and then started declining, as did its financial situation. The progress made in 2007 was thwarted by the political nature of SEDAPAR's corporate culture, and the company's failure to institutionalize effective planning and management practices.

The turnaround framework draws on findings from the five turnaround case studies and previously formulated hypotheses. In general, each hypothesis looked at one factor identified as essential to turning around water utilities. Each case was analyzed to assess whether key factors had been present during its turnaround. The most relevant findings emerged from identifying conditions that the successful turnaround utilities (CESAN, DAWACO, ONEA, and SONEB) shared.

The success index was used to compare the performance levels of the turnaround utilities studied. It is a composite performance index that aggregates service indicators (coverage, continuity, and average consumption) and management efficiency indicators (operating cost coverage, collection rate, NRW, and staff per 1,000 connections).[5]

The parameters used in the success index were only used to compare the *change* in performance of the turnaround case studies. They do not necessarily reflect the global best practice for each indicator. For instance, the indicator for *sufficiency*, measured in liters per person served per day, may vary, depending on water scarcity and other local factors. In addition, the

selection of indicators and weights for a composite index could be politically motivated (van den Berg and Danilenko 2017, 35). For these reasons, the turnaround framework does not use the indicators, weights, and parameters of the success index. Instead, it uses the performance table and maturity matrices to be introduced in section 4.1. Table 3.1 presents the seven indicators of the success index measured before and after each turnaround.

Figure 3.1 shows the aggregate score for the seven indicators presented in table 3.1. The change in the success index before, during, and after the turnaround shows how service provision and management effectiveness evolved for each utility. The baseline is defined as the value in the year before each turnaround began (denoted as T-1). Compared to this baseline, the success index increased for every utility, indicating that improvements were realized. As pointed out before, every utility except SEDAPAR maintained the improvements after the turnaround had been completed. The turnaround framework draws significantly on the findings of these five turnaround case studies.

3.1.2 Additional Case Studies

As discussed, the turnaround framework also draws on other cases of well-performing utilities found in the literature. Findings from previous studies helped confirm the findings from the turnaround case studies. The following reports present the findings of these additional studies:

- World Bank Report funded by the Bank-Netherlands Water Partnership (Baietti, Kingdom, and van Ginneken 2006). This study includes 11 case studies of well-performing water utilities from five continents.

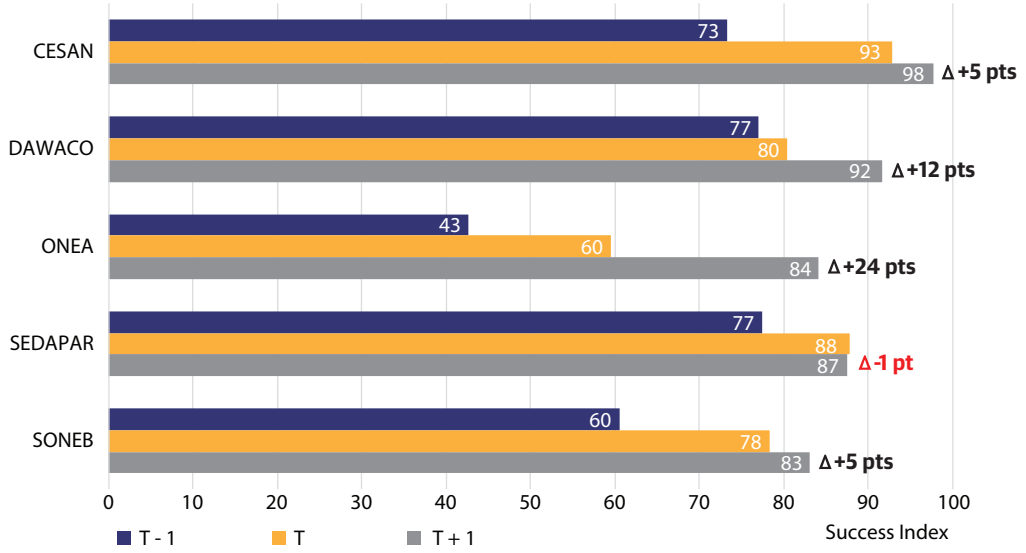
TABLE 3.1. Seven Success Index Indicators of the Turnaround Case Studies

Indicator	CESAN		DAWACO		ONEA		SEDAPAR		SONEB	
	T – 1	T + 1	T – 1	T + 1	T – 1	T + 1	T – 1	T + 1	T – 1	T + 1
Water coverage (%)	95.0	99.0	48.0	73.6	37.2	76.0	85.4	85.7	53.3	67.8
Average consumption (*liters/person served/day*)	198	200	148	180	72	47	105	112	49	38
Water continuity (*hours of service/day*)	23.9	23.9	24.0	24.0	14.4	22.1	21.2	22.8	21.0	24.0
Operating cost coverage (*ratio*)	0.93	1.19	1.09	1.57	0.90	2.15	1.09	1.33	0.81	1.50
Collection rate (%)	83.5	92.2	100	100	85.5	94.0	95.8	91.3	96.1	93.5
NRW (%)	36.0	21.8	38.6	19.3	19.6	18.3	33.0	33.3	22.2	23.3
Staff per 1,000 connections (*staff/1,000 conn.*)	2.1	2.1	6.0	3.5	22.0	4.4	3.6	2.5	4.9	3.6

Utility	T – 1	T + 1
CESAN	2002	2013
DAWACO	2005	2012
ONEA	1996	2007
SEDAPAR	2006	2013
SONEB	2003	2013

Note: NRW = nonrevenue water. Data are presented according to *T*, which represents the year of each utility's turnaround, when most improvements peaked. *T* – 1 represents the year before each turnaround began, and *T* + 1 represents the year after the turnaround had been completed.

FIGURE 3.1. Success Index for Turnaround Case Studies



Utility	T - 1	T	T + 1
CESAN	2002	2004	2013
DAWACO	2005	2007	2012
ONEA	1996	2001	2007
SEDAPAR	2006	2009	2013
SONEB	2003	2005	2013

Note: Data are presented according to *T*, which represents the year of each utility's turnaround, when most improvements peaked. *T* – 1 represents the year before each turnaround began, and *T* + 1 represents the year after the turnaround had been completed.

- Rebel Group Report (Engelsman and Leushuis 2016). This report was based on three case studies from three different continents and drew on four other case studies.
- World Bank Report (Heymans et al. 2016). This study looked at five case studies of successful water utilities in Sub-Saharan Africa.

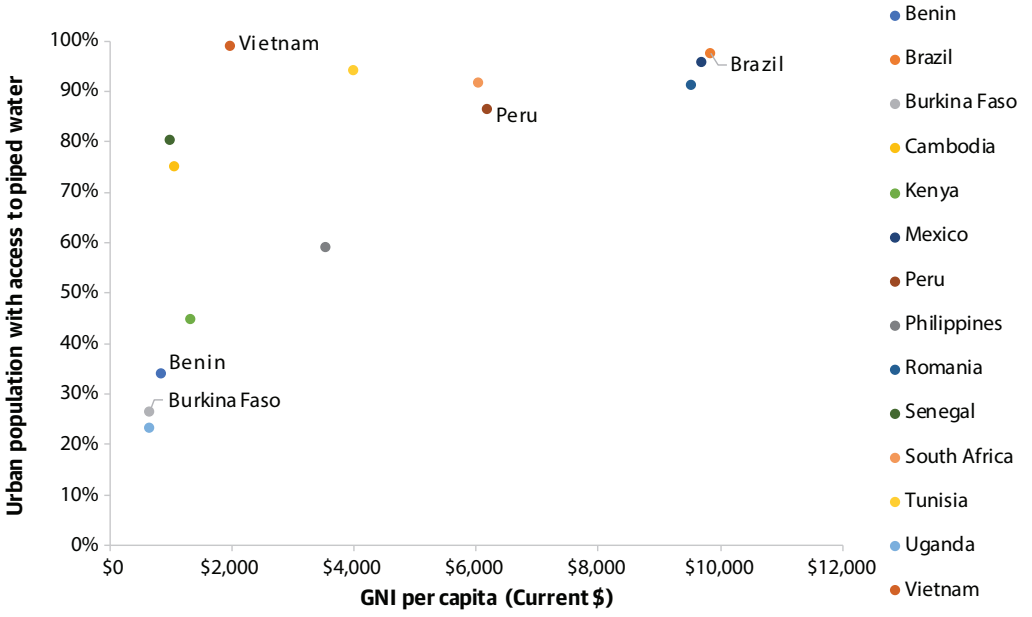
These earlier studies analyzed an additional 15 water utilities[6] that transitioned from poorly performing to successful in North and South America, Africa, Europe, and Asia. These utilities have different institutional models and decentralization levels and operate in countries with different income levels. They include government-owned and joint-stock companies, statutory bodies, and ringfenced departments; some are national utilities, while others only provide water services to specific regions or municipalities (see appendix E for more detailed information). Table 3.2 presents key characteristics of these utilities.

The wide variety of cases suggests that transforming poorly performing water utilities into successful companies is possible in different kinds of environments. For instance, higher access to piped water is not strongly correlated with higher income levels. Figure 3.2 shows a plot of gross national income (GNI) per capita versus urban access to piped water for the case studies.[7] [8]

TABLE 3.2. Utilities Analyzed by Previous Studies

Utility	City or region, country	Institutional model	Country income level	Publication/report
APA Vital	Iaşi, Romania	Joint-stock company	Upper-middle income	Engelsman and Leushuis
AQUA	Bielsko-Biala, Poland	Mixed company	High-income	Baietti et al.
eThekwini	Durban, South Africa	Government-owned company	Upper-middle income	Heymans et al.
HPWSC	Hai Phong, Vietnam	Joint-stock company	Low-middle income	Baietti et al.
JNB Water	Johannesburg, South Africa	Government-owned company	Upper-middle income	Baietti et al.
NWSC	Uganda	Statutory body	Low-income	Baietti et al.; Heymans et al.
NYEWASCO	Nyeri, Kenya	Government-owned company	Low-middle income	Engelsman and Leushuis; Heymans et al.
PPWSA	Phnom Penh, Cambodia	Government-owned company	Low-middle income	Engelsman and Leushuis
PUB	Singapore	Statutory body	High-income	Baietti et al.
PWD	Philadelphia, United States	Ringfenced department	High-income	Baietti et al.
SANASA	Campinas, Brazil	Mixed company	Upper-middle income	Baietti et al.
Scottish Water	Scotland, United Kingdom	Government-owned company	High-income	Baietti et al.
SDE	Senegal	Government-owned company	Low-income	Heymans et al.
SIMAPAG	Guanajuato, Mexico	Statutory body	Upper-middle income	Baietti et al.
SONEDE	Tunisia	Statutory body	Low-middle income	Baietti et al.

FIGURE 3.2. GNI per Capita vs. Access to Piped Water, 2015



Source: World Development Indicators website (http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators); WHO/UNICEF 2015.
Note: GNI = Gross National Income.

It shows that Vietnam, a *lower* middle-income country, has a level of access to piped water similar to Brazil's, which is an *upper* middle-income country. Brazil's access level is predictably higher, in view of its gross national income (GNI) per capita of $9,850 in 2015. Vietnam's access level, however, is surprisingly high, considering its GNI per capita of $1,980 that same year.

In addition, some countries with lower GNI per capita have higher levels of access to piped water than countries with higher GNI per capita. Take Senegal, for instance, a country with a GNI per capita of $1,000 in 2015, where 80 percent of the urban population is served by piped water to private premises. On the other hand, in the Philippines, a country with a GNI per capita of $3,450 in 2015, only 59 percent of the urban population is connected.

The data shown in figure 3.2 suggest that the proposed turnaround framework can be useful, practical, and applicable to underperforming utilities around the world and in countries with a wide range of income levels. Moreover, the findings from previous studies largely correspond to the lessons learned from the turnaround case studies. They show common drivers of change and the need to respond pragmatically to specific contexts and unforeseeable events.

3.2 Necessary Conditions before Starting a Turnaround

The empirical evidence from the case studies indicates that specific factors need to be present before starting a utility turnaround. These factors include catalysts that provide space for change, government leaders who champion the required reforms, and a competent manager with sufficient managerial autonomy to implement change. The first two conditions are exogenous and provide an opportunity to start a turnaround. However, these conditions alone do not ensure the success of a utility turnaround.

Catalysts ranged from an acute or chronic crisis to a purposely designed intervention to create space for change. Typical circumstances that created room for change were chronic water shortages (as in the case of ONEA); severe financial distress; and a political decision affecting the utility's status quo, among others:

- **Credible threat to the livelihood of the utility's staff.** For example, a threat to privatize the utility. This was the case of CESAN, where the staff were under threat of privatization and made a commitment to improve performance.
- **Loss of funding**. For example, the government decides to stop transferring funds on an ad hoc basis, as the utility needs them. This happened to DAWACO when the government of Vietnam implemented reforms for SOEs that eliminated all subsidies.
- **Change in or application/enforcement of regulatory framework**. For example, a new regulator introduces regulation to enforce a previously unobserved law. In the case of SEDAPAR, Peru's water regulator pushed the utility to finally adopt a multiyear strategic plan that linked performance targets to tariff adjustments.

A **government champion** committed to reform is a politician who assumes a direct leadership role in championing reforms in the sector. All utilities in the turnaround case studies had a government champion who gave the utility sufficient autonomy to deepen reforms without interference or predation from other parts of government. Other utilities analyzed, including

eThekwini, NWSC, NYEWASCO, and SDE, also had a government champion who pushed for reform. Conversely, Scottish Water's reform efforts were hampered by the lack of political support for the utility's autonomy.

In addition to these exogenous factors, evidence suggests that capable and entrepreneurial utility managers play a critical role in utility reforms. Every successful turnaround case had a **competent manager**, thereby raising the confidence of government authorities in the utility. A competent manager should guide the utility's staff in making critical changes from the very start of the turnaround process. That manager will identify early gains that will build credibility and instill confidence in the utility's staff that a turnaround is possible. Therefore, governance arrangements—whether established by law or through a political scheme—must give the relevant body the freedom to appoint a competent general manager for the utility.

The manager must have a minimal level of **managerial autonomy** to make decisions and take action to begin the turnaround. In fact, the successful cases had governance arrangements giving the general manager the necessary level of autonomy and incentives to ensure good performance. At PPWSA, the general manager had the trust of both the prime minister and the city mayor, who gave him sufficient autonomy to enact deep reforms before the utility was granted formal autonomy. A manager must generally be responsible for the most important decisions—staffing, prioritizing areas of improvement, allocating existing resources, and leading interactions with government and other leaders. Having the freedom to carry out at least some of these actions is crucial to building credibility and improving performance. In fact, efforts to start a turnaround without a competent utility manager with the necessary autonomy tended to end in failure, as illustrated by the experience of SEDAPAR.

3.3 Actions That Build the Operational and Managerial Capacity of Successful Utilities

Building a water utility's operational and managerial capacity requires improving the five elements of the success pyramid: organization and strategy, human resources, and financial management, as well as commercial and technical operations. These elements thrive in an enabling governing environment, comprising the legal framework and governance in which the utility operates. For each area to be improved, specific actions contribute to performance.

3.3.1 Organization and Strategy

A well-developed strategy based on a **detailed baseline** assessment is necessary to complete and sustain turnarounds. Establishing a baseline that accurately diagnoses the utility's financial, operational, and commercial situation is necessary to make informed decisions in the early stages of a turnaround. In fact, every successful turnaround case study had developed a baseline. The baseline provides the most accurate picture possible for setting yearly targets to monitor improvements. As the utility improves its performance, the information it has available will increase and become more precise.

Once the baseline has been established, a utility should define a multiyear plan based on the current situation and desired performance. The plan should clearly define **multiyear targets**, the actions required to meet those targets, and the resources needed to finance those actions.

CESAN and DAWACO created plans with multiyear key performance indicators. NWSC, ONEA, SONEB, and SONEDE entered into contractual agreements with their respective governments to outline multiyear service targets. JNB Water established multiyear targets through an external management contract, while PUB and AQUA followed multiyear targets as specified by government regulators. APA Vital defined multiyear targets through a loan provision before it established a performance contract with a local government association. SEDAPAR developed a plan with multiyear targets during its turnaround but as management failed to institutionalize this practice, it failed to maintain its improved performance.

Implementing an actionable **multiyear business plan** is necessary to create a clear development path. Improving a water utility requires coordinating many different aspects over several years—for example, obtaining reliable information, creating a competent and incentivized team, designing and developing new distribution networks and water treatment plants, and increasing collections from customers. The successful turnaround utilities had prepared and implemented business plans that integrated these actions, identified the resources required, and set clear targets. Utilities from previous studies, including AQUA, had done this as well. The capacity to design and implement such plans differentiate water utilities that were able to sustain good performance from those that were not.

Having comprehensive **management information systems (MISs**) in place is crucial to monitor performance and adjust plans. Successful water utilities rely on accurate, detailed, and up-to-date information for their operations and capital investments. In many of the earlier case studies, including NYEWASCO, HPWSC, and SANASA, this information was integrated into a single MIS. For turnaround utilities such as CESAN and DAWACO, MISs provide live data to support daily decision-making. MISs were considered central to successful utilities. They optimize operations that are core to the business—including human resource management (HRM), network operations, metering, billing, and collecting.

3.3.2 Human Resource Management

Developing and managing human resources effectively is an essential element of a turnaround. An important first step is to develop and implement a staffing plan that is consistent with the utility's multiyear strategy. A **staffing plan** identifies the necessary composition, size, and structure of a water utility's staff. A good staffing plan considers outsourcing initiatives, the introduction of new technologies, and the expected gains in labor productivity through training and development.

All successful utilities had developed staffing plans early in the turnaround process. DAWACO's staffing plan identified which staff should be trained and which jobs should be outsourced to carry out its strategic plan. AQUA used a similar approach.

Staff evaluations and training, as they relate to performance management, are also important for successful turnarounds. Successful water utilities have highly motivated and qualified staff, and successful performance management contributes to developing and retaining this staff. At SONEB, staff members were enrolled in 3-year training programs. In addition, employees' performance was evaluated annually, based on a performance objective contract cosigned by employees and their manager.

Getting compensation right is important for effective HRM. **Performance-based compensation** seems to be necessary for sustaining a turnaround. Tying compensation to performance is an important incentive that raises staff productivity and efficiency.

Successful water utilities such as SIMAPAG, HPWSC, and NWSC, have performance plans for each employee that are directly linked to the utility's overarching strategy and goals. As in the case of CESAN, performance is measured against targets aligned with the utility's overall performance targets, and compensation reflects the employee's performance. CESAN formalized performance evaluations by creating a results-based management system, which evaluates individual staff performance against the company's strategic plan. Employee compensation formulas were adjusted to include performance-based remuneration, which increased productivity across all departments. HPWSC implemented a similar program, which helped improve labor productivity—from 30 to 7.4 employees per 1,000 connections.

Offering **competitive compensation** is another important aspect of HRM. Successful water utilities like HPWSC offer competitive compensation to ensure they can attract and retain well-qualified employees. However, in some jurisdictions, public water utilities face legal constraints on the compensation they can offer. Under these circumstances, utilities find other ways to retain well-qualified employees.

3.3.3 Financial Management

Successful water utilities are financially sustainable. For instance, all the case study utilities that successfully turned around had also become financially sustainable by the end of the process. A **financially sustainable** utility covers its reasonable costs with a relatively predictable income stream, primarily derived from tariffs charged to its customers. It uses that income stream efficiently by **controlling expenses** and **managing cash flow**.

Ideally, **tariffs** cover at least operating expenditures (OPEX), and the utility should aim to recover all costs through tariffs in the long run. However, utilities may not have the credibility to increase tariffs to cost-recovery levels until they demonstrate efficiency and effectiveness. In that case, utility managers may find it more effective to first reduce costs and increase the reliability of government financial support—via **subsidies** or **transfers**—at the start of the turnaround. Previous studies have also shown that improving operational efficiency translates into greater financial stability because operational and management costs are controlled (Caroline van den Berg and Alexander Danilenko 2017, 79).

Achieving financial sustainability by **increasing cash flow from operations** demonstrates a commitment to improving performance. In all turnaround case studies, utilities made initial commitments and followed through on them, which allowed them to garner support and access funding from stakeholders to begin improvements. CESAN, for example, adopted a dual approach that cut costs, by reducing wasteful spending, and increased revenue, by raising the number of connections. This approach was so successful that CESAN persuaded the World Bank to reinstate previously canceled loans.

Having predictable sources of funding allows management to plan the operating and capital expenditures required to meet performance targets. During this process, capital expenditures

(CAPEX) should not compromise the financial sustainability of the water utility. While CAPEX are necessary and important for water utilities, the utility's processes and systems must be improved before making large-scale infrastructure investments. Except for ONEA—which lacked the infrastructure needed to cover its water demand—none of the turnaround utilities reviewed had made large capital investments early on in their turnarounds.

3.3.4 Technical and Commercial Operations

In a poorly performing utility, the **nonrevenue water** (NRW) ratio is likely to be high and needs to be lowered to improve service levels. To sustain good-quality services, a strategy for reducing NRW to its *economic* level must be developed.[9] NRW has a direct and adverse effect on a water utility's service to customers and its financial performance. This was the case of DAWACO, which had an NRW level of about 39 percent, which it lowered to 19 percent during its turnaround. HPWSC also focused on lowering NRW and implemented a program that reduced NRW from 70 to 32 percent in 6 years. While most poorly performing water utilities have NRW levels that should be substantially reduced, the fact that NRW levels cannot be measured accurately due to the lack of data makes it particularly challenging.

Using the same logic, clear **metering** policies and a strategy to meter all connections must be in place to complete a turnaround. In all turnaround case studies, metering was recognized as a key component of successful operations—every utility experienced an absolute increase in metering throughout its turnaround. Producing and distributing water is at the core of a water utility's business. Meters are essential to giving utilities accurate information about the volumes of water produced, distributed, and consumed by customers. Some of the utilities analyzed in earlier studies, such as PPWSA, installed meters to help lower corruption and improve transparency. In addition, customer meters create incentives to use water efficiently, and are indispensable for keeping commercial losses in check. New technologies, such as prepaid meters and pay-by-phone platforms, can help utilities further improve in this area.

Metering consumption is also important for accurate customer billing. To complete and sustain a turnaround, **billing and collection systems** must be linked to a comprehensive customer database and be integrated with MISs. Successful turnaround utilities invested in information systems that digitalized commercial functions and improved integration between billing and collections. CESAN, for example, implemented SICAT, a digital system that integrates commercial, customer service, and operational areas. SIMAPAG also institutionalized a reliable billing and collection system to improve operations. The turnaround case studies put in place systems that helped keep collection rates above 85 percent—doing so ensured the utilities had sufficient cash to operate and continue investing in improvements.

An effective **customer service strategy** also requires a comprehensive customer database. The case studies showed that successful utilities interact efficiently with their customers on everyday affairs—providing water and accurately billing them for it, responding to their complaints, connecting (and disconnecting) them, and settling accounts with them.

3.3.5 Legal Framework and Governance

While a competent utility manager with sufficient autonomy is needed to start a turnaround, robust legal frameworks and governance, including **formal rules and structures**, should be developed to sustain the improvements achieved—by preventing predation and political interference. This in turn ensures success in the long run. By the end of their turnaround, all successful utilities had established formal rules. CESAN and DAWACO benefited from new water laws, while ONEA and SONEB signed *Contrat Plans* with their respective governments. Utilities from previous studies, such as SONEDE and APA Vital, also entered into agreements with government entities that formalized rules and structures. A study on improved utility performance in Africa also emphasized the importance of incentivized contracts to sustainable success (van den Berg and Danilenko 2017, 87).

Embedding external alliances also plays a role in sustaining successful utility reform; alliances with customers, the government, development partners, and other stakeholders help build momentum for reform and are thus vital. External stakeholders can propose changes in the water utility and protect it from predation once the utility has turned around. For example, eThekwini built alliances with customers through community consultation committees, particularly in poor areas. NWSC, NYEWASCO, and ONEA followed a similar approach and used *baranzas* (intentional gatherings) to foster relationships with their customers. Conversely, DAWACO entered a USP with Dutch development donors and its municipal government, allowing it to follow a credible turnaround path and quickly start improving performance.

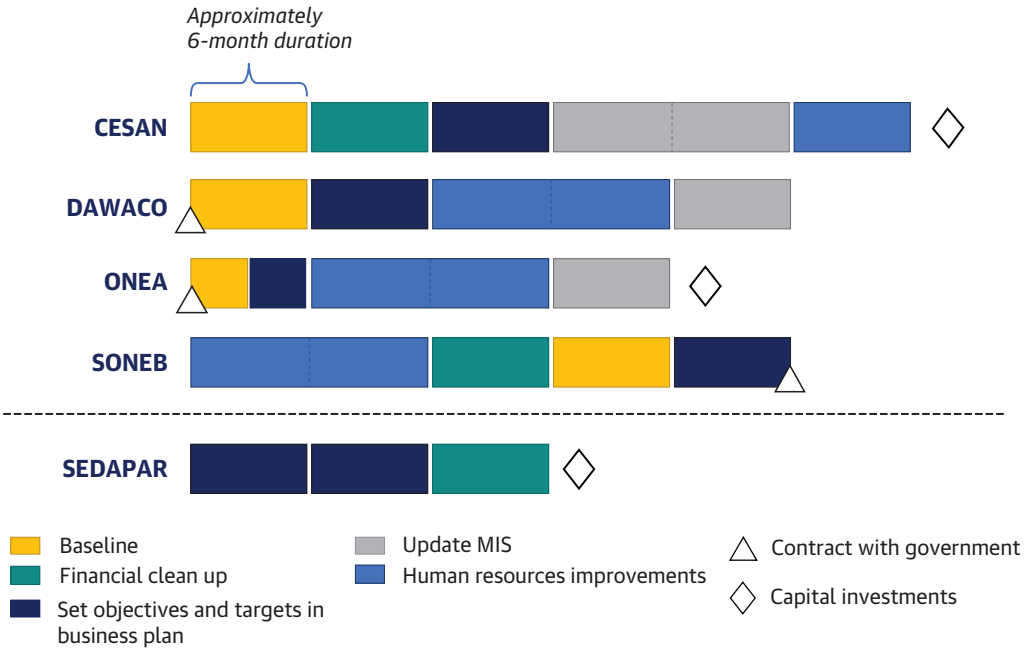
Oversight and regulation are important during utility reform. Previous studies note that successful reform does not necessarily require a regulatory agency (van den Berg and Danilenko 2017, 55). In fact, oversight can occur in different ways, but the monitoring system in place must ensure transparency and measure performance accurately. Utilities should demonstrate their performance to the government in a credible, transparent, and accurate manner. For instance, SONEB's *Contrat Plan* with the government of Benin laid out reciprocal commitments, ultimately aimed at providing better water services. These commitments are evaluated annually with specific indicators. As to AQUA, the company must follow its business plan and meet performance targets. Failure to meet targets can result in shareholders acting against the company. The case studies indicate that adequate monitoring and reporting systems can sometimes be established without a central oversight body or regulatory authority.

3.4 Factors to Consider for Sequencing a Turnaround

Utilities that successfully turned around carried out similar actions in roughly the same order, be it in different contexts and of varying duration (figure 3.3). These actions include establishing a baseline, cleaning up finances, setting objectives and targets (in a business plan), updating MISs, and improving human resources.

In most cases (including the other studies), utilities established a baseline in the early stages of the turnaround as a key input for their business plan. As a result, utilities experiencing

FIGURE 3.3. Turnaround Sequences



* Rough estimate of duration and sequence of actions. Actions do not necessarily immediately follow each other.

Note: MIS = management information system.

significant financial distress focused first on achieving financial sustainability by increasing revenues and/or decreasing costs. Utilities next focused on setting multiyear targets and developing sustainable business plans. For example, SDE developed a comprehensive long-term plan that first aimed to rapidly increase water production and expand service to the poor.

Almost invariably, the first actions aimed to improve human resources and MISs. At NWSC, for instance, management quickly invested in a corporate training facility to enhance staff capacity after clearly defining the company's vision, mission, and objectives. At NYEWASCO, management adopted modern MISs to build internal capacity and a culture of transparency. Once improvements were under way, some utilities switched their focus to the sizable capital investments needed to meet ambitious goals.

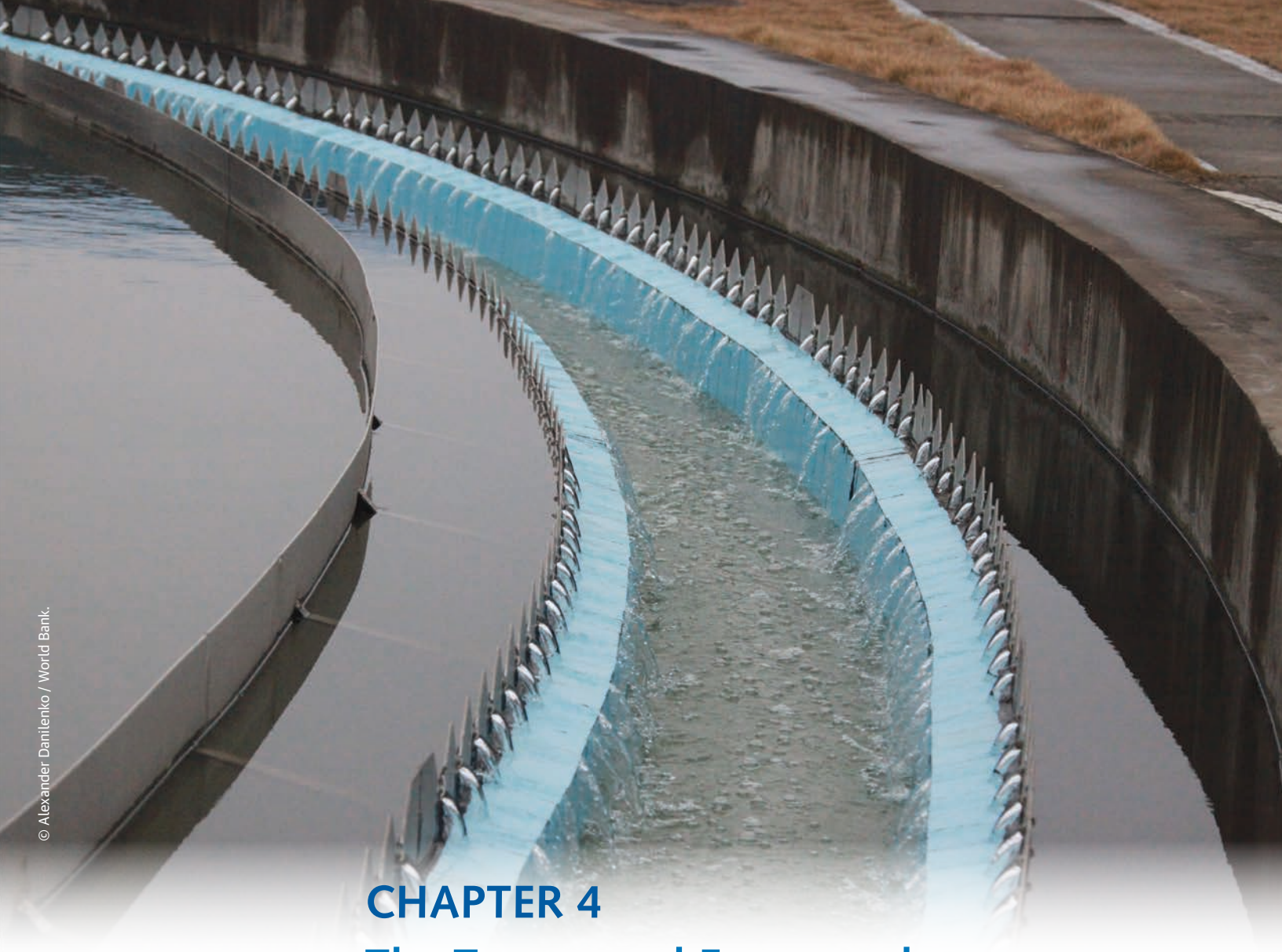
Three of the utilities reviewed—NWSC, SONEDE, and APA Vital—entered into contracts with the government at some point during their turnaround. This resulted in formal structures that defined the utility's expected performance, as well as the government's financial support to meet those performance targets. Other utilities used incentivized contracts for the same purpose, with senior management teams (eThekwini) or *affermage* contracts[10] (SDE).

Notes

1. Appendix C provides a summary of the actions taken by the five turnaround utilities and their respective results.
2. In 1996, the state government of Espírito Santo obtained a R$115 million loan from the Brazilian Development Bank (BNDES) to cover its expenses. To obtain the loan, the state government provided CESAN's shares as collateral and agreed to privatize CESAN to settle the debt. To increase the company's potential upside for prospective investors, the state government in fact encouraged mismanagement. Many subcontractors had *padrinhos políticos* (political godfathers) to guarantee their contracts, regardless of cost efficiency or performance. Total expenditures exceeded CESAN's revenue from 1996 to 2002.
3. ONEA utility data, 2016.
4. Before 2003, water and electricity services were provided by Société Béninoise de l'Eau et de l'Électricité (SBEE), a single parastatal utility (with some political authority and serving the states indirectly). Even so, SBEE struggled in terms of financial performance and service provision. In 2002, the government decided to reform the water and electricity sectors and created SONEB, a separate public water utility, to improve service delivery.
5. Details on the composition of the success index are given in appendix F.
6. The utilities reviewed by these studies overlap to some extent.
7. GNI per capita is the gross national income, converted to U.S. dollars using the World Bank Atlas method, divided by the midyear population (source: World Development Indicators website: http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators).
8. Urban access to an *improved water source* refers to the percentage of the urban population using an improved drinking water source. The improved drinking water source includes *piped water on premises* (piped household water connection located inside the user's dwelling, plot, or yard), and *other improved drinking water sources* (public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, and rainwater collection) (WHO/UNICEF 2015).
9. The economic level of NRW is defined as the level of water losses that results from a policy where the marginal cost of managing losses is equal to the marginal value of water in the supply zone (see appendix G for more information).
10. In the case of an *affermage* contract, the operator does not receive a fixed fee for his services from the awarding authority but charges consumers an operator fee. The operator retains the operator fee out of the receipts and pays an additional surcharge (charged to customers) to the awarding authority, which goes toward investments that the awarding authority is making / has made in the infrastructure.

PART II

THE TURNAROUND FRAMEWORK: A GUIDE FOR IMPROVING WATER UTILITIES' PERFORMANCE



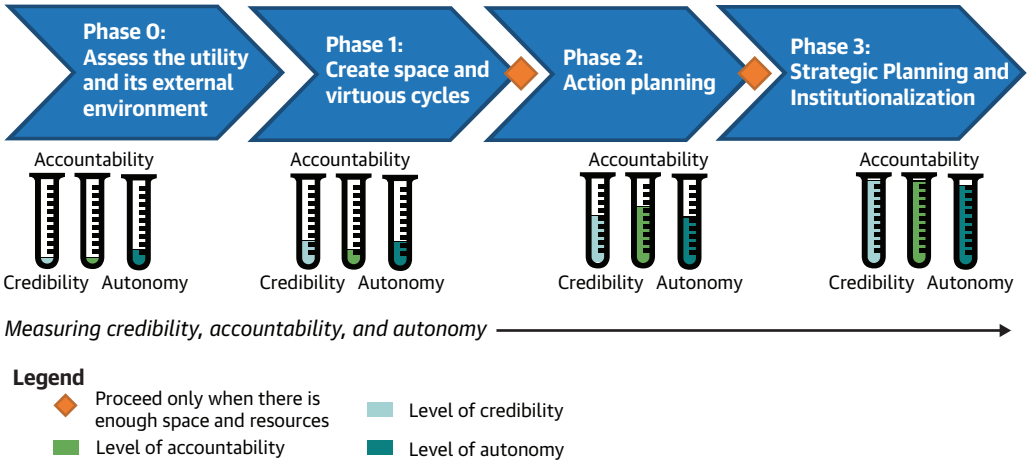
CHAPTER 4
The Turnaround Framework

The turnaround framework guides water utilities in improving performance. It recognizes that poor performance can originate from internal factors as well as dysfunctional political economies—where water utilities often operate with little or no credibility, accountability, and autonomy. It shows how to best use the space available for change in a dysfunctional political economy equilibrium, and how to coordinate and prioritize actions to improve operational and managerial capacity (figure 4.1).

The framework can be adapted to utilities' specific situation and context. It can be applied to any water utility, regardless of its overall maturity, current performance, legal status, and extent of dysfunction in its political economy equilibrium. Even the most dysfunctional political economy environment provides some space for change.

The framework consists of four phases, each comprising several steps. To implement each phase, several tools can be used (section 4.1). Phase 0 is a preliminary phase in which the current state of the utility and its external environment are assessed (section 4.2). From the final step of phase 0, the water utility should proceed to the phase that provides the kind of

FIGURE 4.1. The Turnaround Framework



intervention it requires. Some utilities may be ready to proceed to phase 2 or phase 3 directly; others will have to begin in phase 1.

From phase 1 onward, it is proposed all steps be taken sequentially and, to the extent possible, in the order set by the framework. Phase 1 (section 4.3) is intended to help the utility's manager do relatively small, low-cost interventions to build the credibility, accountability, and autonomy necessary to move on to phase 2. Phase 2 (section 4.4) allows management to design and implement action plans. Finally, in phase 3 (section 4.5), management develops and implements measures that further raise the utility's maturity level, institutionalize best practices, and enable it to make long-term strategic plans.

Utilities can face a multitude of challenges at different times, and the improvement process may not be as linear as laid out in this report. However, the turnaround framework provides a foundation for thinking critically about these challenges in a sequential and stylized manner.

The framework recognizes that capital investments may be an important part of turning around a utility. Capital investments can be essential for increasing access to WSS services, improving service quality, and increasing operational efficiency. The framework does emphasize the need to ensure the utility has thorough knowledge of its systems and sufficient internal capacity when making these investments. This focus on strengthening the internal capacity of the utility should lead to more efficient and effective capital investments.

4.1 Tools of the Turnaround Framework

Several tools have been developed for the turnaround framework. The *decision tool* is meant to help assess (the utility and its environment), the analysis tools are meant to identify priority actions, and the navigation tools make it easier to navigate to the appropriate phase in the framework (table 4.1). These tools and their corresponding outputs are used to progress through each phase of the framework and discussed in the remainder of this section.

TABLE 4.1. Tools and Outputs in Each Phase

Name of tool or output	Phase 0	Phase 1	Phase 2	Phase 3
Decision tool	✓			
Analysis tools				
Performance table	✓	✓		
Initial maturity matrix	✓	✓		
Maturity matrices			✓	✓
Action matrices		✓	✓	✓
Navigation tools				
Phase 2 checklist	✓	✓		
Phase 3 checklist	✓		✓	
Outputs from the Tools				
Performance cobweb	✓	✓		
Initial maturity cobweb	✓	✓		
Maturity cobweb			✓	✓

4.1.1 Decision Tool

The decision tool has been developed in MS Excel (available for download free of charge from http://pubdocs.worldbank.org/en/584671537890987229/Utility-Turnaround-Framework-Decision-Tool.xlsm). In phase 0 it is used to collect and assess quantitative and qualitative data on the utility's performance and its external environment. The tool captures information about the utility's financial situation, current operating performance, level of access and quality of service provided, and maturity of its management systems. In addition, the decision tool contains other framework tools, such as the phase 2 and phase 3 checklists. It uses the information from the performance table and initial maturity matrix to assess the utility data. The decision tool contains the information and analysis needed to determine the steps a utility should take after phase 0. Figure 4.2 illustrates the relationship between the worksheets of the decision tool.

4.1.2 Analysis Tools

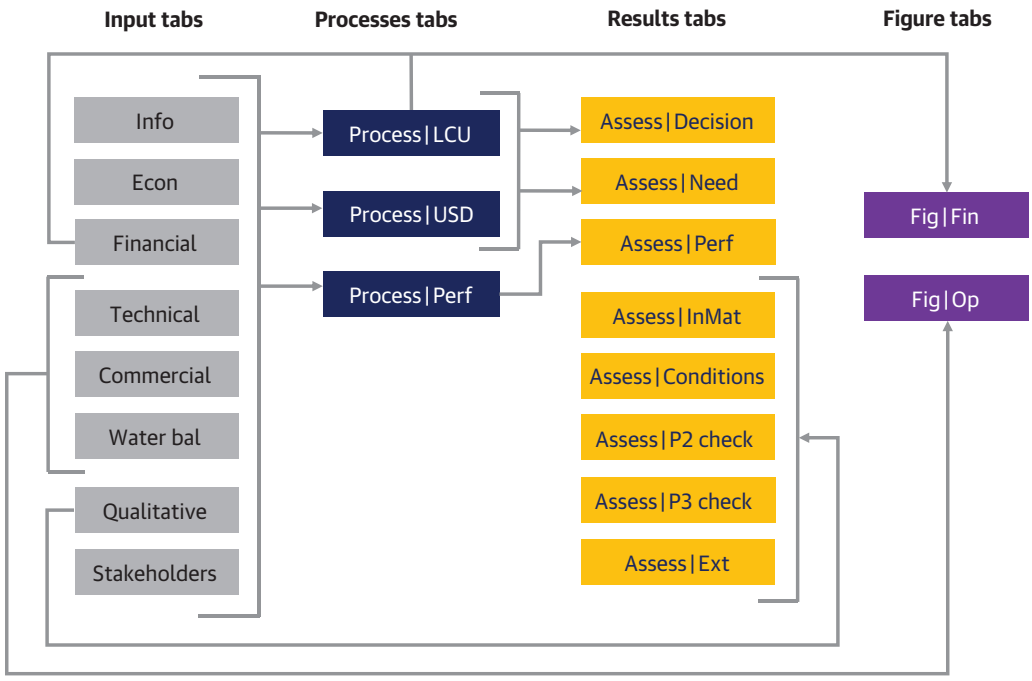
Analysis tools enable the utility to analyze the best course of action in subsequent phases of the turnaround framework, based on an evaluation of utility performance and maturity levels.

Performance Table

The performance table (table 4.2) is used in both phase 0 and phase 1. It uses predefined values based on the performance of water utilities in developing countries. Moreover, it maps the utility's performance against key indicators of the five elements in the success pyramid related to the utility's operations and management.[1]

The utility's performance in each element/area is mapped to the following levels: 1 (elementary), 2 (basic), 3 (good), 4 (well-performing), and 5 (world-class). These levels have been developed based on empirical data observed in water utilities in developing countries. For example, when assessing performance in *Technical Operations*, a utility with a NRW ratio higher than

FIGURE 4.2. Relationship Between Worksheets in Decision Tool



Note: Ext = external environment; Fin = financial figures; InMat = initial maturity; LCU = Local currency unit; Op = operational figures; Perf = current performance; P2 check = phase 2 checklist; P3 check = phase 3 checklist; USD = United States dollars; water bal = water balance. Need refers to turnaround need; conditions refer to the conditions to start a turnaround.

TABLE 4.2. Performance Table

	1	2	3	4	5
Element	**Elementary**	**Basic**	**Good**	**Well-Performing**	**World-Class**
Organization & Strategy	• No performance targets	• Has measurable annual targets[a] • Index of aggregate performance targets is less than 40%[b]	• Index of aggregate performance targets is between 40% and 80%	• Index of aggregate performance targets is between 80% and 90%	• Index of aggregate performance targets above 90%
Human Resource Management	• Staff per thousand connections is greater than 10	• Staff per thousand connections is between 6.5 and 10	• Staff per thousand connections is between 5.0 and 6.5	• Staff per thousand connections is between 2.5 and 5	• Staff per thousand connections is less than 2.5
Financial Management	• Negative EBITDA margin[c]	• EBITDA margin is positive, but less than 5%	• EBITDA margin is between 5% and 18% • DSCR[d] exceeds 1.2	• EBITDA margin is between 18% and 30% • DSCR exceeds 1.2 • Net income (before subsidies) is positive	• EBITDA margin is greater than 30% • DSCR exceeds 1.2 • Net income (before subsidies) is positive • The utility's planned CAPEX for the next 3 years is fully funded. • More than 50% of the planned CAPEX is financed with debt

TABLE 4.2.continued

Element	1 Elementary	2 Basic	3 Good	4 Well-Performing	5 World-Class
Technical Operations	• Piped water coverage is less than 50%[e] • Continuity cannot be measured or is less than 8 hours a day on average • NRW is greater than 60% or is unknown[f]	• Piped water coverage is between 50% and 75% • Continuity of between 8 and 15 hours a day on average • NRW is between 40% and 60%	• Piped water coverage is between 75% and 85% • Continuity of between 15 and 20 hours a day on average • NRW is between 30% and 40% and utility has a good understanding of the NRW value	• Piped water coverage is between 85% and 95% • Continuity of more than 20, but less than 24 hours a day on average • NRW is below 30% and has fallen significantly during the past several years	• Piped water coverage is above 95% • Continuity of 24 hours a day • NRW is approaching the utility's economic level
	• Average consumption is below 50 liters per capita per day (lpcd) or above 500 lpcd • 0% of households in the service area are connected to a centralized wastewater system • 0% of the wastewater collected is treated	• Average consumption is between 50 and 100 lpcd, or between 350 and 500 lpcd • Less than 20% of households in the service area are connected to a centralized wastewater system • Less than 50% of wastewater collected is treated	• Average consumption is between 50 and 100 lpcd, or between 200 and 350 lpcd • Between 20% and 50% of households are connected to a centralized wastewater system • Between 50% and 75% of wastewater collected is treated	• Average consumption completely meets the need of customers • Between 50% and 80% of households are connected to a centralized wastewater system • Between 75% and 90% of wastewater collected is treated	• Average consumption completely meets the need of customers • More than 80% of households are connected to a centralized wastewater system • More than 90% of wastewater collected is treated
Commercial Operations[g]	• Collection rate[h] is below 60% • Accounts receivable (days)[i] is greater than 180 days	• Collection rate is between 60% and 70% • Accounts receivable (days) is between 180 days and 90 days	• Collection rate is between 70% and 90% • Accounts receivable (days) is between 90 days and 60 days	• Collection rate is between 90% and 95% • Accounts receivable (days) is between 60 days and 30 days	• Collection rate is greater than 95% • Accounts receivable (days) is less than 30 days

Note: CAPEX = capital expenditures; DSCR = debt service coverage ratio; EBITDA = earnings before interest, tax, depreciation, and amortization; lpcd = liters per capita per day; NRW = nonrevenue water.

a. The utility has a document that clearly establishes specific measurable annual targets. The document is approved by its board of directors or the manager of the utility.

b. In addition to having a document that clearly establishes specific measurable targets, which is approved by its board of directors or the manager of the utility, the utility meets less than 40 percent of those targets (e.g., if the utility has set 10 targets and meets only 4 of these, its index of aggregate performance targets would be 40 percent).

c. The EBITDA (earnings before interest, taxes, depreciation, and amortization) margin is equal to (revenues minus operating expenses) divided by revenues.

d. The Debt Service Coverage Ratio (DSCR) is equal to EBITDA divided by (interest plus repayment of principal).

e. Piped water coverage is defined as the percentage of the population living within the utility's service area that is connected to the utility's network.

f. Liters per connection per day lost is a more accurate measure of NRW. However, many utilities in developing countries do not have the capacity to measure this indicator. Therefore, this table uses NRW as a percent of water into supply so that it can be applied to all utilities. If, during the application of the framework, it becomes apparent that this approach can be improved, the performance table will be changed.

g. If data for collection rate are not available, the assessment of performance in commercial operations is based only on the utility's accounts receivable (days).

h. The collection rate is equal to cash collected from customers divided by billed amount.

i. Accounts receivable (days) is equal to accounts receivable (net of provisions for doubtful accounts) divided by revenues, and then multiplied by 365.

60 percent is assigned a level 1 performance (elementary), while a utility with a NRW ratio lower than 30 percent and which has significantly fallen in the past years is assigned a level 4 performance (well-performing).

The performance table provides a picture of the utility's relative performance in each of these five areas. Its results are graphically represented in the performance cobweb which has five spokes, each showing the utility's performance level in the five elements related to its operations and management. The cobweb should be used in phases 0 and 1 to help decide on the next steps to take, based on performance. It shows in what areas the utility's performance is relatively strong or relatively weak.[2]

Initial Maturity Matrix

The initial maturity matrix (box 4.1 and table 4.3) is used in phase 0 and phase 1, and works similarly to the performance table. It indicates the initial institutional maturity in the five areas of the success pyramid related to the utility's operations and management.[3]

By using predefined descriptions, the matrix maps the institutional maturity of each element to the same five levels as those used in the performance table. For example, a utility with no mission or vision, no business plan, and deficient management, receives a 1 (elementary) for organization and strategy. Conversely, a utility with a shared mission and vision, and the capacity to implement a strategic plan to help meet the water SDGs within 10 years receives a 5 (world-class).

Maturity Matrices

Maturity matrices should first be used in phase 2. While they build on the initial maturity matrix, they are more elaborate, as each element of the success pyramid has its own maturity matrix. As a result, the maturity matrices provide an in-depth understanding of the institutionalized processes, systems, and procedures for each element.

Because these matrices are comprehensive, it may take about 3 months for a team of specialists to assess a utility's maturity in a certain area. For instance, the maturity matrix for HRM includes descriptors of the utility's human resource strategy, staff training, capacity building,

BOX 4.1. The Initial Maturity Matrix

The initial maturity matrix is intended to produce the indicative maturity of a utility within a short period of time (approximately 2 weeks). The mapping of the five areas is visually represented in the initial maturity cobweb. In phase 0, the initial maturity cobweb helps decide on the next steps to take, based on initial maturity. In phase 1, it is used in conjunction with the performance cobweb to choose the most urgent areas for improvement.

The initial maturity matrix serves as a *preliminary* assessment. It is replaced by the maturity cobweb in phase 2, which is the output of the more comprehensive maturity matrix.

TABLE 4.3. Initial Maturity Matrix

Element	1 Elementary	2 Basic	3 Good	4 Well-Performing	5 World-Class
Organization & Strategy	• Utility does not have a mission and vision	• Utility has a mission and a vision	• Utility has a mission and vision shared by all staff	• Utility has a mission and vision shared by all staff	• Utility has a mission and vision shared by all staff
	• Utility does not have a business plan	• Utility has an annual business plan that is being implemented	• Utility has a multiyear business plan that is being implemented	• Utility has a fully funded, multiyear business plan that is being implemented	• Utility is implementing a strategic plan to help achieve SDGs within 10 years
	• Utility has deficient management	• Utility has a competent manager whose decisions translate into results	• Utility has a competent manager whose decisions translate into results, and managers who meet regularly, have university degrees and relevant experience	• Utility has a competent manager whose decisions translate into results, and managers who meet regularly to define strategy. Managers have university degrees, relevant experience, authority to allocate resources, and are held accountable for meeting targets	• Utility has a competent manager whose decisions translate into results, and managers meet regularly to define strategy. Managers have university degrees, relevant experience, authority to allocate resources, and face repercussions for not meeting targets
	• Utility does not have an acceptable system for assessing and developing capital investment projects	• Utility has a specific project cycle for assessing and developing capital investment projects	• Utility has a specific project cycle as well as specific procurement processes it enforces	• Utility has a specific project cycle, procurement processes it enforces, the ability to carry out cost-benefit analyses, and a capital investment plan	• Utility has a specific project cycle, procurement processes it enforces, ability to carry out cost-benefit analyses, and a capital investment plan that is fully funded
	• Utility uses IT systems in a limited way	• Basic IT systems are in place and in use	• Some IT systems and operational systems and tools are in place and integrated across select departments of the utility (e.g., SCADA or SAP ERP)	• All necessary IT systems and operational systems and tools are in place and integrated across select departments (e.g., SCADA and SAP ERP)	• IT systems and operational systems and tools are in place and fully integrated across all departments. New technologies are proactively pursued and deployed
	• Utility does not have an IWRM plan	• Utility is developing an integrated water resource management plan	• Utility has developed and begun to implement an IWRM plan	• Utility has developed, is continuously updating, and has been implementing a comprehensive IWRM plan	• Utility has developed, is continuously updating, and has been implementing a comprehensive IWRM plan in conjunction with all relevant stakeholders

table continues next page

TABLE 4.3. continued

Element	1 Elementary	2 Basic	3 Good	4 Well-Performing	5 World-Class
Human Resource Management	• Approximate staff number is not known	• Required number of staff is not known	• Required number of staff is known, but not adhered to	• Staffing level is close to the required number of staff	• Staffing levels are at the required number of staff
	• No HR system is in place	• HR system is in place, but not reliable	• Utility has comprehensive and accurate HR system	• Comprehensive and accurate HR system is in place	• Comprehensive and accurate HR system is in place
	• There is no gender awareness	• There is gender awareness for positions	• Active policy to engage women in suitable positions	• Women are represented at multiple levels	• Policy on equal opportunity and compensation
	• No clear job descriptions or role profiles are aligned with the strategic intent of the organization	• Some job descriptions for strategic positions	• There are job descriptions for all positions	• Job descriptions are aligned with intent of the organization	• Clear job descriptions or role profiles are aligned with strategic intent of the organization
	• Some evidence shows that staff compensation is below the local market level	• Some evidence shows that staff compensation is below the local market level	• Some evidence shows that staff compensation is adequate for the local market	• Performance-based compensation is competitive in the local market	• Utility has performance-based compensation that is competitive in the local market
	• No performance evaluations are conducted	• Performance evaluations are conducted irregularly	• Regular performance evaluations (at least once a year) are conducted	• Compensation and promotions are directly linked to annual performance evaluations	• Compensation and promotions are directly linked to annual performance evaluations
			• Formal training programs are in place	• Staff training and capacity building are actively managed	• Staff training and capacity building are actively managed
				• Utility carries out standardized annual surveys to measure employee satisfaction	• High employee satisfaction is evidenced in standardized annual staff surveys
Financial Management	• No financial operating budget exists	• Utility has a balanced and detailed budget for coming year	• Cost controls are in place to ensure that the actual budget does not exceed the planned budget	• Balanced and detailed financial projections and budget meet the mid-term business plan and utility strategy	• Utility has access to long-term commercial finance with own balance sheet
		• Accounting procedures and financial accounts comply with legal requirements	• Complete annual financial statements are prepared according to IFRS and reviewed by external auditors		• Reliable budgeting and planning cycle is in place

TABLE 4.3. continued

Element	1 Elementary	2 Basic	3 Good	4 Well-Performing	5 World-Class
Technical Operations	• No measurement of water into supply and consumption is conducted	• Utility conducts minimal measurement of water into supply and consumption	• Water balance is produced with a margin of error of less than 15%	• Water balance is produced with a margin of error of approx. 10%	• Water balance is produced with a margin of error of approximately 5%, and regularly updated
				• Utility has a unit that is responsible for managing real losses	• Utility has implemented a fully comprehensive NRW-management strategy effectively
	• Utility has a reactive approach to maintenance	• Maintenance is at initial level	• Maintenance and budget are planned	• Utility has well-planned and budgeted O&M • Utility has preventive maintenance	• Preventive maintenance is based on risk assessment
	• Utility has no level of asset management	• Utility has a basic record of all infrastructure, but it is not updated	• Record of assets and valuation of assets is maintained	• Asset management system is in place	• Lifecycle costing of assets is in place
	• Utility does not test water quality	• Utility tests water quality regularly, but does not use accredited labs	• Utility tests water quality regularly. All testing is done with accredited labs. Results of the testing are published at least once a year	• Utility tests water quality regularly. All testing is done with accredited labs. Results of testing are published at least once a year	• Utility tests water quality regularly. All testing is done with accredited labs. Results of testing are published at least once a year
Commercial Operations[a]	• Limited information is available about the location of, consumption by, and accounts receivable from each customer	• Customer cadaster is in use, but not reliable	• Customer cadaster is up to date and accurate	• Customer cadaster is up to date and accurate, and fully integrated with financials	• Customer relationship management is effective
	• Less than 25% of customers are metered	• Between 25% and 60% of customers are metered	• Between 61% and 85% of customers are metered	• Between 86% and 95% of customers are metered	• More than 95% of customers are metered
	• Billing based on no meter reading	• Meter reading inaccurate and incomplete	• Billing is based on meter reading for more than 60% of billed users	• Billing is based on meter reading for more than 85% of billed users	• Meter reading in place and accurate
	• No active public relations	• Some outreach to customers through PR on an ad hoc basis	• PR strategy with clear messaging	• PR strategy with an engagement of different user groups (gender sensitive)	• PR strategy and active outreach to different user groups (surveys, community groups, gender groups)

Note: ERP = enterprise resource planning; HR = human resources; IFRS = International Financial Reporting Standards; IT = information technology; IWRM = integrated water resources management; O&M = operations and maintenance; SCADA = supervisory control and data acquisition.
a. The glossary includes a definition of "accounts receivable."

annual staff surveys, and performance-based compensation (appendix A). To complete this matrix, the assessment team will not only need to look into any staffing plan, but also need to review the CVs of key management staff to evaluate qualifications and competency.

The assessment results in a maturity cobweb, which is the visual representation of the results for each of the five areas of the utility's operations and management.

Action Matrices

The action matrices are used in phase 1, phase 2, and phase 3. They provide examples of typical actions that a utility can take to raise the five maturity levels. Each element of the success pyramid has four action matrices, each corresponding to a specific level ranging from 1 (elementary) to 4 (well-performing).[4]

Every action is designed to reach the next level of maturity, and accompanied by a cost estimate, expected impact, and likely duration. While the list of potential actions is not exhaustive, managers should use the suggestions in the action matrix as reference to choose the actions with the highest impact for which the utility has the time and money.

For example, a low-cost, high-impact action for a utility with a maturity level of 1 in *organization and strategy* could be developing a shared mission and vision with a highly participatory approach within the utility. This action could be completed in 3 to 6 months. For a utility with a maturity level of 2 in organization and strategy, a typical action could be designing and implementing integrated IT systems and operations systems and tools. Even so, this action is much more expensive, and could take about two years to implement.

4.1.3 Navigation Tools

The navigation tools are the phase 2 and phase 3 checklists, intended to help a utility *navigate* through the various phases of the turnaround framework.

The **phase 2 checklist** can be used to determine whether a utility is ready to start phase 2; it lists the key requirements for being able to prepare an action plan (box 4.2 and section 4.2.5).

The **phase 3 checklist** can be used—in phase 0 and phase 2—to determine whether a utility is ready to start phase 3, as it specifies the conditions that should be met (section 4.4.5). In *phase 0*, checklist 3 should be used to verify whether the utility has the capacity to proceed immediately to phase 3 (box 4.4 and section 4.2.5). In *phase 2*, checklist 3 should be used to verify whether the utility has the necessary capacity to start phase 3 (box 4.4 and section 4.4.5).

Tools

- Decision tool
- Performance Table
- Initial Maturity Matrix
- Phase 2 Checklist
- Phase 3 Checklist

4.2 Phase 0: Assess Utility and Its External Environment

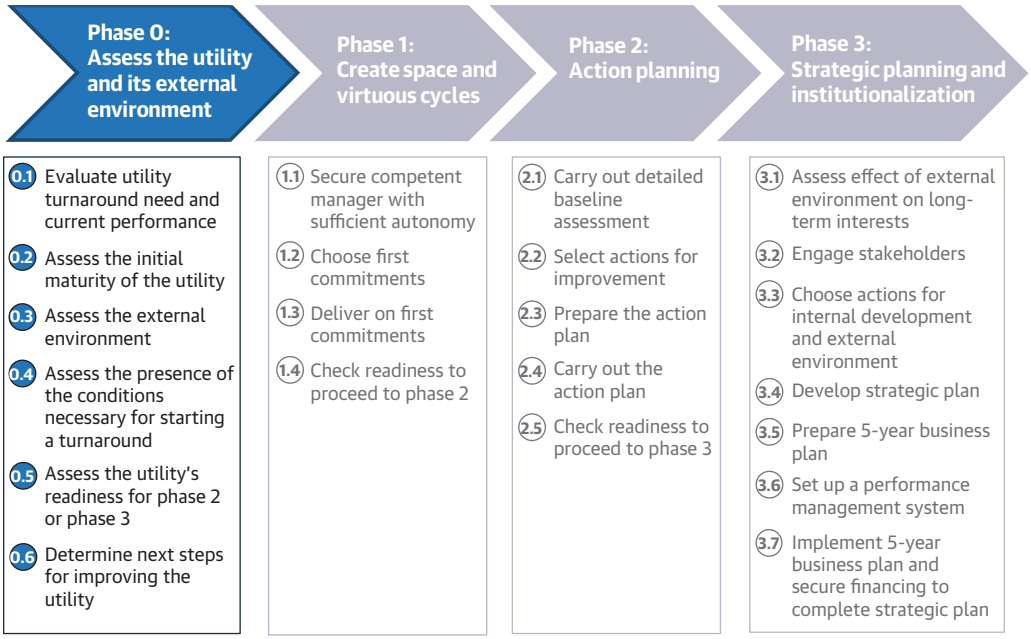
Phase 0 is the *preliminary* phase of the turnaround framework. It is meant to assess the utility's current state and external environment; whether the conditions necessary to start a turnaround are present; and its readiness to prepare an action plan or a strategic plan.[5] The assessment uses tools specifically developed for the framework (see toolbox to the right).

Phase 0 consists of six steps (figure 4.3) and can usually be completed in 2 to 3 weeks. The utility's manager should lead the assessments but may need outside assistance.

BOX 4.2. Phase 2 Checklist

- **The utility has a government champion and a competent manager with a minimum level of autonomy.** This provides the utility with the necessary support to successfully develop and implement an action plan.
- **The utility no longer needs to "fight fires"** (Kayaga, Mugabi, and Kingdom 2013, 25), **allowing management to dedicate enough time to more comprehensive planning).** On the other hand, if management constantly has to deal with crises, it cannot focus on designing a strategy or implementing structural improvements.
- **The utility has the information needed to develop an initial baseline.** More specifically, it must have key information about its assets, resources, and operations.
- **The utility has sufficient internally generated cash.** To implement the action plan, the utility must be able to finance it. Additional funds can be derived from increased operational revenues or reduced costs.
- **The utility has access to external funding.** This funding source may include loans from multilateral development banks and grants from international donors.

FIGURE 4.3. Steps to Assess the Utility's State and Its External Environment



The assessment itself is carried out in steps 0.1 through 0.5, and its results inform the selection of further steps to be taken. While these first five steps do not have to be carried out sequentially, they should all be completed before step 0.6. Once the assessment is completed, the next phase can be determined.

If the utility fails to meet some of the requirements for a turnaround or does not have the resources to prepare an action plan, it is best to begin with phase 1. Other utilities may be ready to move on directly to phase 2 or 3, depending on the results of the assessment.

4.2.1 Step 0.1: Evaluate Utility Turnaround Need and Current Performance

The first step of phase 0 requires a thorough understanding of the water utility's performance. It is meant to assess the level of performance and determine if a turnaround is necessary. The latter can be determined by checking whether the utility meets the goals of service and access for customers at a reasonable cost and in a sustainable way—based on indicators of the utility's quality of service, access to WSS, affordability, and financial sustainability.

Understanding the utility's performance requires considering key indicators for each element of the success pyramid (figure 2.1). Key indicators of commercial and technical operations include the collection rate and piped water coverage; a key financial management indicator is the earnings before interest, taxes, depreciation, and amortization (EBITDA) margin, while performance in organization and strategy can be assessed by looking at how well management measures and achieves targets.

The frameworks' decision tool captures the data required to evaluate performance and establish whether a turnaround is needed. Within the tool, the worksheet *Assess|Need* compares the utility's performance against thresholds of expected performance, determined by local stakeholders (regulator, government, municipality). The worksheet results clearly indicate whether the utility meets or fails to meet the standards and thus needs a turnaround or not (figure 4.4).

Besides determining the need for a turnaround, to evaluate performance efficiently and systematically, the decision tool uses the performance table, which maps the utility's performance level in each element of the success pyramid (table 4.2). The indicators that map performance include the key performance indicators in the success index, as well as other indicators for operations and management, such as EBITDA margin and debt service coverage ratio (DSCR).

The performance table maps water utilities across five levels: 1 (elementary), 2 (basic), 3 (good), 4 (well-performing), and 5 (world-class). These levels are based on empirical data observed in water utilities in developing countries. For example, a *basic* water utility is one that has measurable annual targets; provides piped water coverage to between 50 and 75 percent of the population in its service area, and less than 20 percent of households are connected to a wastewater system; provides water between 8 and 14 hours a day; has an NRW ratio between 40 and 60 percent and an EBITDA margin smaller than 5 percent; collects between 60 and 70 percent of its revenue; and staff productivity is between 6.6 and 10, measured by number of staff per 1,000 water connections.

FIGURE 4.4. Assess|Need Worksheet in Decision Tool (Example)

Turnaround need

Determine turnaround

Is the utility currently meeting the desired goals related to WSS services and access at a reasonable cost and in a sustainable way?

TBD

General information	
Utility country	
Utility name	
Utility code	
Region	

Indicator results vs. thresholds					
Component	**Series unit**	**Latest year available**	**Result**	**Threshold**	**Need**
Water coverage	%	2016	69.60%	90.00%	Yes
Average consumption	Liters/capita/day	2016	128	100	No
Continuity	Hours/day	2016	11	23	Yes
Sewerage coverage	%	2017	15.20%	60.00%	Yes
Wastewater treatment coverage	%	2017	65.00%	50.00%	No
Affordability[a]	%	2016	2.70%	2.00%	Yes
Operating cost coverage	Ratio	2017	0.9	1.2	Yes
Positive cash from operations	LCU '000	2017	-39,694	Positive	Yes

Note: LCU '000 = local currency unit (x 1,000); TBD = to be determined; WSS = water supply and sanitation.
a. The affordability threshold is based on the share of total household income spent on water each month.

Conversely, a *world-class* water utility regularly measures its performance targets and meets over 95 percent of them; provides piped water service on average 24 hours per day to over 95 percent of the population in its service area, and has an NRW approaching the utility's economic level; has an EBITDA margin greater than 30 percent and a positive net income, and has its planned CAPEX for the next 3 years fully funded; collects over 99 percent of its revenue; and has fewer than 2.5 staff per 1,000 water connections.

Though the performance table is systematic and standard, the mapping process is flexible and acknowledges differences within and across elements. When evaluating performance with the performance table, the level of each indicator of each element of the success pyramid has to be established. For example, a water utility may have a collection rate above 95 percent, but its accounts receivable balance may be equivalent to 50 days of revenue. In that case, although the utility's commercial performance would lie between a 5 (world-class) and a 4 (well-performing), it would be mapped as a 4.

A water utility may be at different levels for each element of the success pyramid. However, the overall scoring equals the score most often achieved in any of the five elements. For example, a water utility may be a 4 (well-performing) in HRM, organization and strategy, technical

operations, and commercial operations. In financial management, however, it may be a 3 (good). In this case, the water utility would be mapped as a 4 (well-performing).

The decision tool generates a cobweb that visually illustrates asymmetries in performance. Figure 4.5 shows the performance cobweb for a hypothetical utility whose commercial and technical performance is lagging relative to the other areas of the success pyramid.

4.2.2 Step 0.2: Assess Initial Maturity of the Utility

The second step in this phase is to make an initial assessment of the utility's *institutional* maturity. This requires evaluating the systems, processes, and procedures that drive corporate culture and produce outcomes in each element of the success pyramid. A comprehensive and detailed assessment of the utility's institutional maturity is a long process, but key qualitative indicators help gauge the quality and effectiveness of the systems, processes, and procedures that underlie a utility's performance. For example, the maturity of the utility's financial management can be evaluated by looking at the level of sophistication of its financial statements and budget planning processes. Similarly, the maturity of the utility's management of human resources can be evaluated by looking at staffing and performance standards, as well as by gauging the utility's stance on training and capacity building for its employees.

The information collected with the decision tool provides the qualitative data required to assess the initial maturity of the utility. Over 100 questions help to provide a good understanding of the utility's maturity, as well as of the factors and entities that advance or hinder it. This tool processes the data and compares them against the initial maturity matrix (table 4.3). The initial maturity matrix maps water utilities across the same five levels as the performance table: from elementary to world-class. The systems, processes, and procedures assessed for each element of the success pyramid are drawn from the Water Utility Maturity Model by Kayaga, Mugabi, and Kingdom (2013), the International Water Association's AquaRating Tool (IWA and IDB 2017),[6] and the International Water Association's Water Utility Efficiency Assessment Matrix (IWA-WUEAM) (International Water Association 2013).

FIGURE 4.5. Example of a Performance Cobweb

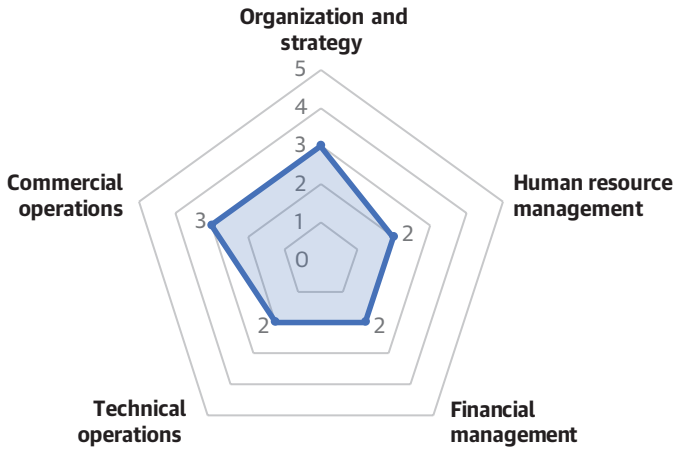
The levels in the initial maturity matrix also draw from these tools, as well as from empirical patterns of water utilities observed in developing countries by the authors of this report. For example, a utility may have a *basic* level of initial maturity if its manager is competent, but its middle management is less so; the utility would have a rough record of assets and some measurement of water supply and consumption; it would have a somewhat reliable customer cadaster, and between 25 and 60 percent of customers would be metered; it would have a detailed and balanced budget, and its accounting procedures would comply with legal requirements; the required number of staff would not be known, and staff compensation would be below market levels.

Conversely, in a water utility with a *world-class* level of initial maturity, the entire management team would be extremely competent—managers would have university degrees, relevant experience, and the authority to allocate resources; they would also meet regularly to discuss strategy and face repercussions when failing to meet targets.; the utility would have a comprehensive NRW-management strategy, and a lifecycle costing of assets; it would also have access to long-term commercial finance with its own balance sheet; it would have a comprehensive and accurate human resource system, with optimum staffing levels and competitively compensated staff based on performance. Table 4.3 shows the initial maturity matrix.

Like the performance table, the initial maturity matrix is systematic and standard, but the mapping process is flexible and acknowledges differences within and across elements. The decision tool generates an initial maturity cobweb that visually illustrates asymmetries in the systems, processes, and procedures for each element of the success pyramid. The *overall* initial maturity scoring equals the score most often achieved in any of the five elements.

Figure 4.6 shows the initial maturity cobweb for a hypothetical utility. In this hypothetical example, the initial maturity assessment suggests that the systems, processes, and procedures in human resources, financial management, and technical operations need to be improved.

FIGURE 4.6. Example of an Initial Maturity Cobweb



The initial maturity and performance cobwebs will be instrumental in strategically selecting a path for improvement, regardless of the phase that the utility is in.[7] The actions required for turning around could target improving performance or maturity, depending on the nature of the asymmetries between both cobwebs. For example, a water utility could be in phase 1, and have levels of initial maturity ranging from 1 to 2 and levels of performance ranging from 3 to 4. In that case, actions for improvement should focus on maturity. In this stage of maturity, the actions to improve are likely to be small and low-cost.

4.2.3 Step 0.3: Assess External Environment

To be certain of the path forward, it is not enough to assess the utility's level of performance and maturity—the external environment also affects the utility's performance. The third step in this phase is therefore to assess the external environment. This includes evaluating the legal framework and governance of the utility, as well as the institutions and actors involved in the production and consumption of water and wastewater services.

A water utility's goal is to provide quality, affordable service to its entire service area in a financially sustainable way. This not only requires having a competent manager, but also a certain kind of external environment, ideally characterized by the following:

- **Strong legal framework.** The utility's legal framework should establish clear rules for providing water and sanitation, including comprehensive guidelines for utility performance, property rights, corporate governance, and duties and responsibilities.
- **Accountability framework.** The utility should enjoy a clearly defined accountability framework that incentivizes effective decision making and resource allocation.
- **Minimal level of autonomy.** The utility should have a minimal level of managerial autonomy to make decisions based on efficiency and strategic foresight. Autonomy can be compromised when political or other vested interests interfere with management decisions in the utility.
- **Government champion.** If the utility operates in a dysfunctional political economy, the water utility will benefit from a government official who prioritizes improvements in the sector and helps secure the resources needed to achieve them (section 3.2).
- **Embedded stakeholders.** The utility should embed all stakeholders that can affect the supply and demand of water and wastewater, for instance, the government, customers, labor unions, and donors. Embedding stakeholders prevents predation and increases transparency. The latter reduces information asymmetries and reassures investors.
- **Predictable long-term tariff-setting regime.** A predictable regime for setting and adjusting tariffs allows for long-term planning and investing.
- **Clear service standards.** The utility should know the water and wastewater service standards for which it is held accountable. These standards are usually set, monitored, and assessed by a regulator or other relevant authority (Locussol and van Ginneken 2010, 13). The utility should have a good understanding of these processes, so information asymmetries are reduced.
- **IWRM.** A water utility should be integrated into the water resources management cycle of its area for both abstraction and discharge of water and wastewater. This requires coordinating

closely with various bodies responsible for managing water resources or making policies relevant to the utility's water supply and its treatment of wastewater.

Assessing the external environment requires identifying the stakeholders that can affect the utility's long-term interests. For instance, the regulatory body responsible for setting tariffs can have an impact on the predictability of the tariff regime. The following stakeholders can affect the long-term interests of the utility and should be identified:

- Stakeholders who participate directly in the supply and demand of water and wastewater services, such as water basin administrators and environmental agencies responsible for regulating effluent limitations and standards;
- Stakeholders with decision-making power and resources related to service provision, such as labor unions, entities of the executive branch, financial market stakeholders, and bilateral and multilateral agencies;
- Stakeholders who are directly or indirectly affected by the results of the utility's service provision, such as customer associations and groups.

Once identified, the objective and relevance of each stakeholder regarding the provision of water and wastewater services should be properly recorded.

Improvements in the utility can begin before all stakeholders are engaged. Relevant stakeholders should be engaged progressively, as their cooperation is needed to further the utility's long-term interests. A poorly performing utility will probably have limited credibility and accountability (section 2.2.2). A utility with low levels of performance and maturity only needs some autonomy, a government champion, and a competent manager to start working on improvements. Spending resources on engaging stakeholders other than those related to these three aspects—a competent manager, the necessary decision-making autonomy, and a government champion—could at this stage be counterproductive (section 3.2).

As the utility improves its performance and maturity, the need to ensure its *long-term* interests will gradually increase. At high levels of performance and maturity, the water utility will be well placed to engage stakeholders and proactively influence the external environment. Sustaining a turnaround ultimately requires improving the utility *and* developing and strengthening the external environment. Even so, it is important to note that a utility should first focus on improving its own performance and maturity before it becomes solely outward focused.

Figure 4.7 illustrates the aspects of the external environment relevant during the three phases of the turnaround framework. The shaded Harvey balls at the bottom of the figure illustrate the degree to which each aspect has become relevant and stakeholders need to be engaged.[8] In phase 1, for example, a utility's maturity will be low. At this point, sufficient decision-making autonomy and the support of a government champion are the only aspects of the external environment relevant for the utility. Even so, it is possible that the utility has begun its turnaround in phase 1 with only a competent manager. In this case, the utility would have to work to improve its credibility and accountability to secure a government champion who actively supports the turnaround before moving to phase 2.

FIGURE 4.7. Progressive Engagement of Stakeholders in External Environment

Note: While a utility may begin phase 1 *with* a government champion, this figure illustrates the progression of a utility that starts phase 1 *without* a government champion and secures one before moving on to phase 2.

As the utility progresses through each phase, and its performance and maturity improve, different aspects of the external environment will become more relevant. Once the utility is in phase 3, proactive stakeholder engagement for all aspects of the external environment is recommended to ensure the utility's long-term sustainability.

4.2.4 Step 0.4: Assess Presence of Conditions Necessary for Starting Turnaround

The fourth step in this phase is to determine whether the conditions to start a successful turnaround are present. As explained in chapter 2, the utility may be operating in a political economy equilibrium that is too dysfunctional to provide effective service. If that equilibrium persists, a turnaround strategy is unlikely to succeed. However, if certain conditions exist, the equilibrium can be tipped over, increasing the likelihood that the turnaround will succeed.

The following conditions have proven to be vital for a water utility to start a turnaround:

- A government champion committed to reform
- A competent manager capable of leading change
- A minimum level of managerial autonomy for decision making.[9]

In addition, catalysts can make it significantly easier to start a turnaround because they have the potential to drive incentives for improvements in the government and the utility. However, if catalysts are absent, utility managers can still start the turnaround as long as they have some autonomy and a government champion. The utility manager may have been in place for a long time and have a good understanding of the utility's challenges, as well as the competency to design actions to overcome them. Yet he may have lacked the autonomy to make effective and efficient decisions. Therefore, the competent manager must be granted the autonomy to start enacting change.

The decision tool captures qualitative data that can help determine whether the conditions for starting a turnaround exist. These data should be collected through interviews with

FIGURE 4.8. Assess | Conditions Worksheet in Decision Tool

Conditions for Starting a Turnaround

Evaluate the conditions for starting a turnaround

Are the conditions necessary for starting a turnaround present?

No

Look for the following conditions:
- *Government champion*
- *Competent and incentivized manager*
- *Minimum level of managerial autonomy*

Conditions	
Condition	**Present?**
Government champion	TBD
Competent and incentivized manager	TBD
Minimum level of managerial autonomy	TBD

Note: TBD = to be determined.

stakeholders inside and outside the utility. Judgment is needed to gauge a government official's degree of commitment to championing improvements in the sector, and to determine whether a manager is competent and autonomous enough to commit and deliver on improvements.

Fortunately, certain signs can help identify the presence of a government champion. A champion is committed to making whatever changes are necessary to enable the right legal and regulatory framework, promote governance incentives, and provide a dependable, stable stream of resources. Typically, management can readily name the government official who supports the reform. Legal and regulatory changes that should take place are normally in the pipeline. Finally, official statements in which the government commits to prioritizing the water sector should be readily accessible through the media. The absence of these signs typically means that the utility lacks a government leader committed to its improvement.

The worksheet *Assess|Conditions* in the decision tool evaluates the qualitative data gathered through interviews (figure 4.8).

4.2.5 Step 0.5: Assess the Utility's Readiness for Phase 2 or Phase 3

The fifth step of this phase is meant to determine whether the utility is ready to begin implementing an *action* plan (phase 2) or a *strategic* plan (phase 3). Utilities that already have the resources and maturity level needed to prepare an action plan or a strategic plan may bypass phase 1 and go directly to phase 2 or phase 3, respectively.

Assess the Utility's Readiness for Phase 2

To prepare a targeted and practical action plan, management must have the time to do so, the information necessary to identify problems and potential solutions, and the financial resources

BOX 4.3. CESAN's Early Actions

Before the start of its turnaround in 2003, a group of senior technical staff persuaded management to hire the consulting firms Fundação Instituto de Administração and Fundação Getulio Vargas to diagnose the company's baseline and propose a turnaround strategy. With this, CESAN gathered the information needed for its turnaround before it started.

After being appointed CESAN's president, Paulo Ruy focused on stabilizing CESAN's finances—that is, "cleaning house." Stabilizing CESAN's finances was identified as essential in the diagnostic carried out by the consulting firms. After only nine months of strict cost reductions, CESAN was generating profits. This provided the funds needed to implement further improvements.

In addition, the credibility and autonomy that Ruy gained early on allowed him to assemble a technical and highly competent team. This enabled CESAN's president to delegate responsibilities, and therefore increase efficiency. Management was no longer forced to deal with daily crises. In turn, this allowed CESAN to start strategic planning soon after beginning its turnaround.

Having gained credibility, the utility was also able to persuade the World Bank to reinstate $12.5 million in previously canceled loan proceeds in 2003 (World Bank 2004, 24). CESAN's progress in implementing several projects following the company's restructuring proved that Ruy had indeed built momentum for change. In 2004, CESAN secured $36 million from the World Bank to extend a coastal pollution management project. In 2008, the World Bank approved another $71.5 million to complete additional water and sewerage works.

necessary to cover the cost of addressing those issues (box 4.2). Once these conditions have been met, the utility has enough credibility and autonomy to bypass phase 1 and move on to the development and implementation of an action plan.

Box 4.3 illustrates the case of a utility that was ready to leave phase 1.

Assess the Utility's Readiness for Phase 3

In this framework, a utility that is providing quality service at a reasonable cost and in a sustainable way does not need to be turned around. And if it does not need a turnaround, the utility may be ready to begin strategic planning and institutionalization, that is, proceed to phase 3.

To prepare a useful strategic plan, the utility needs to aim for world-class performance. For this, the water utility should have discernible levels of performance and maturity. The utility should score at least level 3 in both performance and maturity,[10] and have the vision and ambition to aim for excellence. The phase 3 checklist shows the conditions that must exit for a utility to be able to develop and carry out a strategic plan (box 4.4).

BOX 4.4. Phase 3 Checklist

- **The utility has a clear vision for the future and long-term ambitions.** Management should have institutionalized a clear vision across all layers of the utility. This ensures that staff efforts are aligned in pursuit of the same overarching goals. It should also show that management has long-term, ambitious goals for their overall level of service.
- **The utility has established a multiyear planning cycle.** A system should be in place to ensure that multiyear plans are routinely developed and implemented. To this end, the utility should have started dedicating time to identifying the inputs needed to carry out longer-term planning and large capital investment plans (15–20 years).
- **The utility has a thorough understanding of its human resource needs.** By this point in the turnaround, the utility should be well aware of the strengths and weaknesses of its human resources. It will probably have developed staffing plans and staff performance evaluations. The utility should also have started exploring how to bypass exogenous factors, such as regulatory staffing and remuneration caps.
- **The utility's financial situation is solid enough to service debt and increase its creditworthiness.** The utility is becoming more attractive to private investors thanks to transparent, balanced financial statements and a positive financial outlook. Following this path, the utility will soon be able to secure financing without relying on government support.
- **The utility has identified the roadblocks to achieving universal access to WSS services**. The utility has pinpointed the barriers to increasing its WSS coverage to 100 percent. This will allow the utility to plan in phase 3 how to achieve universal access in the long term.
- **Commercial operations have stopped being a hindrance to all other areas of the utility**. The utility has improved commercial operations—in terms of access, availability, continuity, and planning for universal quality service—to a level in which they do not burden any of the other areas. For instance, the utility has increased its collection rate so it no longer has a negative impact on the utility's finances. At this point, the utility is ready to make customers the central focus of all its operations.
- **The utility monitors, records, and analyzes all information related to its operational efficiency**. At this point in the turnaround, management should have embedded accurate operational efficiency data, such as a water balance with a minimal error margin, in its decision-making processes.

4.2.6 Step 0.6: Determine Next Steps for Improving the Utility

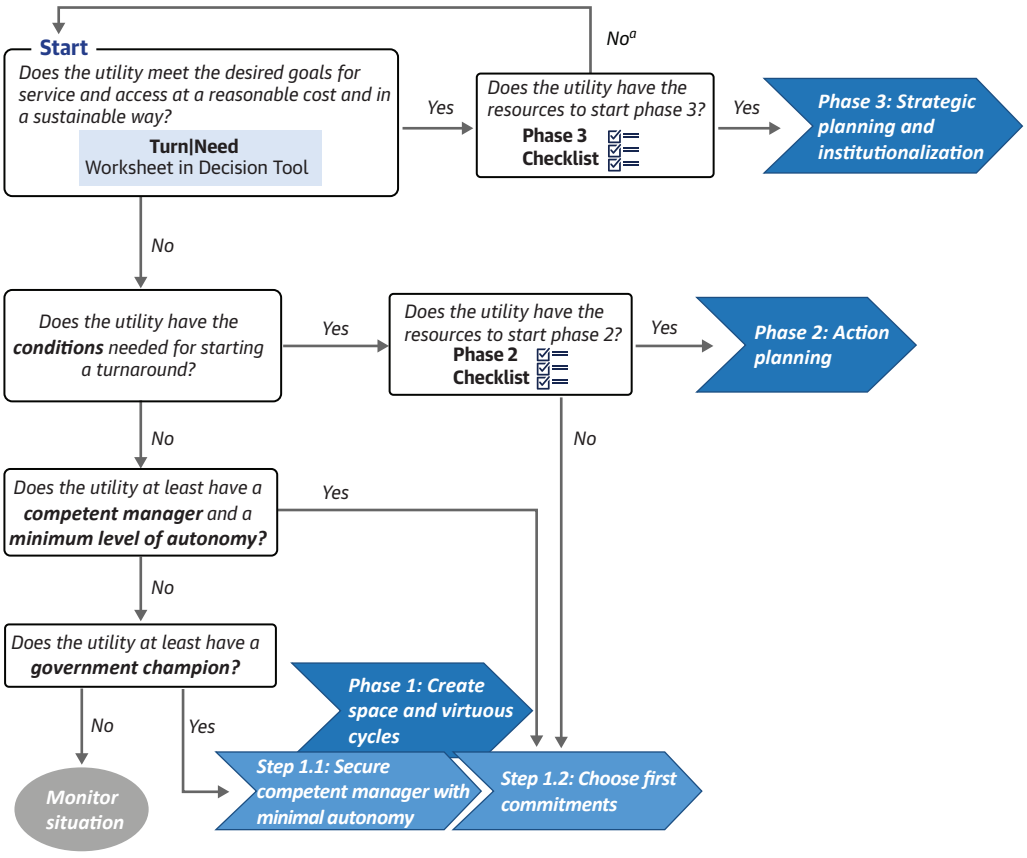
The last step of phase 0 determines what can be done to start improving the utility's performance. A utility may be ready to develop an action plan (phase 2), or to carry out strategic planning (phase 3). Otherwise, it may have to start in phase 1, and implement short-term, high-impact actions that help increase the space for change and resources for planning.

What phase a utility can proceed to depends on the presence of specific elements, as determined through the various phase 0 assessments. Some key factors are the presence of a government champion and a competent manager, and management being able to devote time to strategic planning. More specifically, the decision tool requires inputs from step 0.1 through 0.5 and answers to the following questions:

- Does the utility need to be turned around?
- Is the utility ready to prepare a strategic plan (based on the phase 3 checklist)?
- Do the conditions necessary for starting a turnaround exist?
- Is the utility ready to prepare an action plan (based on the phase 2 checklist)?

Once the answers to these questions are known, a decision tree that includes the *Assess|Decision* worksheet of the decision tool can be applied to those answers to determine the next step to be taken (figure 4.9).

FIGURE 4.9. Decision Tree to Determine Next Step for Improving the Utility



Note: a. If the utility is not ready to start phase 3, it may be necessary to reassess its current performance and turnaround need. This reassessment may show that the utility is not meeting the desired goals for service and access at a reasonable cost and in a sustainable way. In this case, the utility may need to carry out a full-fledged turnaround and therefore go to phase 1 or phase 2.

Does the utility need to be turned around?

A utility that is providing quality service at a reasonable cost and in a sustainable way does not need to be turned around. The data gathered in step 0.1 (section 4.2.1) will indicate whether a turnaround is necessary.

Is the utility ready to prepare a strategic plan?

If it does not need a turnaround, the utility may be ready to begin strategic planning and institutionalization—phase 3. The utility can use the phase 3 checklist to ensure it has the resources and attributes that it needs to proceed directly to phase 3 (box 4.4). If it does, it should move on to phase 3 to develop the strategic plan.

Do the conditions necessary for starting a turnaround exist?

The data gathered in step 0.4 will indicate whether the conditions required to start a turnaround are present. If they are not, it may be best to develop them in phase 1.

If the utility does not have a competent manager with a minimum level of autonomy, but does have a government champion with political clout, it can move on to step 1.1 (section 4.3.1).

If the utility has a competent manager with a minimum level of autonomy, it can proceed to step 1.2 (section 4.3.2).

If not *all* required conditions are present, determining which conditions are sufficient is more of an art than a science. Success will be closely linked to the probability of tipping the dysfunctional political economy equilibrium. If that probability is high enough, the utility may be able to embark on a turnaround path even when not all "necessary' conditions exist. Nevertheless, a utility is unlikely to successfully start a turnaround if it lacks the support of a government champion or the lead of a competent utility manager. For this reason, the decision tree recommends monitoring the situation until at least one of these key players is present.

Tools

- Performance Table
- Initial Maturity Matrix
- Action Matrices
- Phase 2 Checklist

Is the utility ready to prepare an action plan?

Once the utility meets enough criteria to start its turnaround, it will be necessary to determine if it is also ready to prepare an action plan. The phase 2 checklist helps establish whether the utility has the time, information, and financial resources required. If it does, it should move on to phase 2 and develop the action plan; if it does not, it should move on to phase 1.

4.3 Phase 1: Create Space for Change and Virtuous Cycles

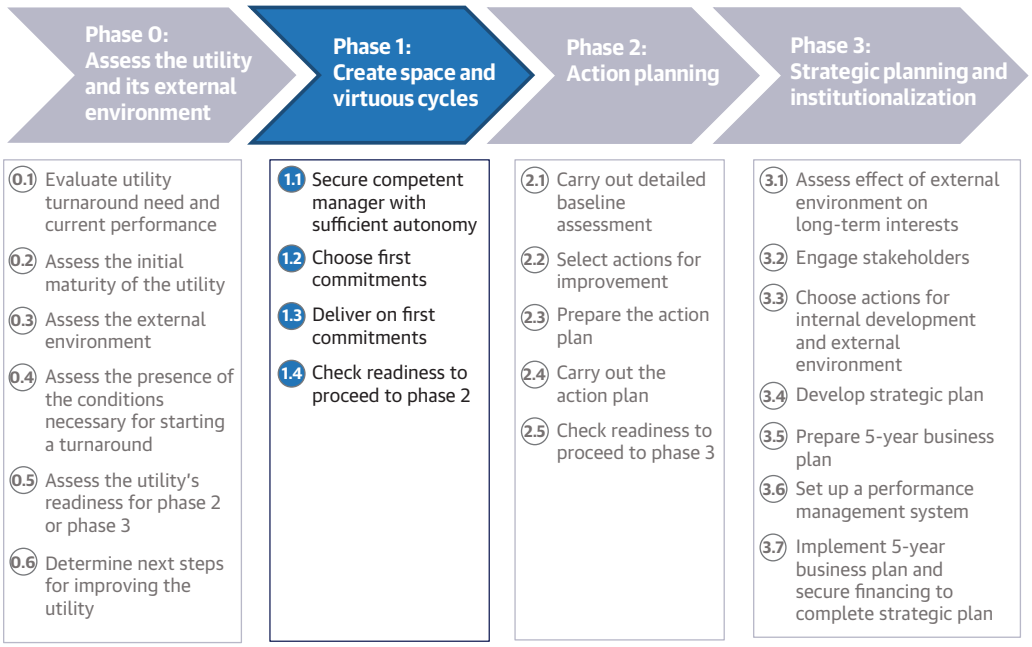
Outputs

- Performance Cobweb
- Initial Maturity Cobweb

This phase aims to develop the credibility, accountability, and autonomy needed to prepare and carry out an action plan. It is meant to create the necessary space for reform (Andrews, Pritchett, and Woolcock 2017, 158). At the end of this phase, the utility should have used the initial space for reform to open a path for *broader* reforms. The four steps of phase 1 are outlined in figure 4.10.

From the phase 0 assessment, the manager will have the information required to start the turnaround—through relatively small but high-impact interventions—to increase credibility,

FIGURE 4.10. Steps to Create Space and Virtuous Cycles



accountability, and autonomy.[11] These carefully targeted interventions will increase the space for change, based on the results of the performance table and the initial maturity matrix from the phase 0 assessment (see tools to the right). The phase 2 checklist helps the manager determine when enough space (for reform) has been created to move on to phase 2.

The timeline for completing phase 1 will vary, depending on the commitments chosen. Ideally, the four steps of phase 1 are completed in 6 months to a year. At the end of this phase, the manager can assess whether the utility is ready for phase 2. If the utility is not ready, phase 1 may have to be repeated several times. Each time it goes through phase 1, the space for change may expand enough to further build credibility.

Phase 1 does not yet rely on well-functioning management structures. Instead, it focuses on actions that a competent utility manager with sufficient autonomy and internal support can carry out (section 4.3.1). To expand the space for change and start virtuous cycles, the utility manager should make commitments that demonstrate a willingness and ability to improve performance (section 4.3.2). Delivering on those commitments will start to build credibility and begin breaking vicious cycles (section 4.3.3). Once the utility has created enough space for change and increased some of its capacity, it will be ready to proceed to phase 2 and develop an action plan (section 4.3.4).

4.3.1 Step 1.1: Secure Competent Manager with Sufficient Autonomy

If the utility does not have a competent manager with a minimum level of autonomy, the first step of phase 1 is to secure one. The government champion would be best placed to help appoint a competent manager and put in place a governance arrangement that grants the manager at

least the minimum level of autonomy required to begin the turnaround. If the existing manager is competent, the government champion would only need to grant the minimum level of autonomy required to begin the turnaround.

The manager should be a strong leader, have a clear vision of the change required, and be self-driven. Moreover, the manager should have the autonomy to make the necessary decisions to start opening up the space for reform—such as reducing operating expenses and achieving basic improvements in human resources—and incentives to perform well. External incentives can be created by the government champion who took on the competent manager, or by more formal arrangements, such as a performance-based compensation scheme.

4.3.2 Step 1.2: Choose First Commitments

The second step involves choosing the first commitments to help break vicious cycles. The manager should make strategic decisions about feasible actions, considering the utility's current level of autonomy, based on a 4-task approach (figure 4.11).

Task 1: Identify Areas of Focus

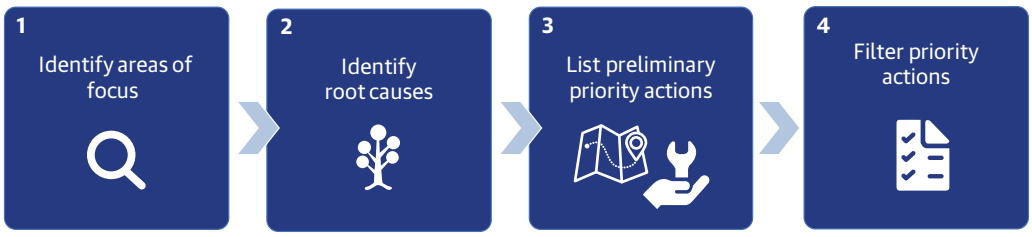
The first task is to *seek balance* in the utility's performance and initial maturity cobwebs. This requires comparing the cobwebs to find the areas where performance and initial maturity level do not overlap. This process typically identifies three areas that the utility should focus on.

Seeking balance in the cobwebs is a two-step process:

1. The cobwebs are first superimposed on each other to **find the mismatches between the five areas**—that is, to identify where performance is lower or higher than the initial maturity level in each area. *Where performance is lower than maturity*, the utility's systems, processes, and procedures are not producing the expected outcomes to support performance; in other words, any mismatch identifies an area that already has sufficient resources but is not using them effectively.

   Where maturity is lower than performance, the utility lacks the systems, processes, and procedures to sustain performance over the long term. Successful processes and systems—those that make the utility more resilient to poor management or external influence and allow the utility to continue improving overall performance—should be institutionalized. If these processes are absent, the utility may be unable to perform at current or higher levels over the medium and long term.

FIGURE 4.11. Approach to Choosing First Commitments



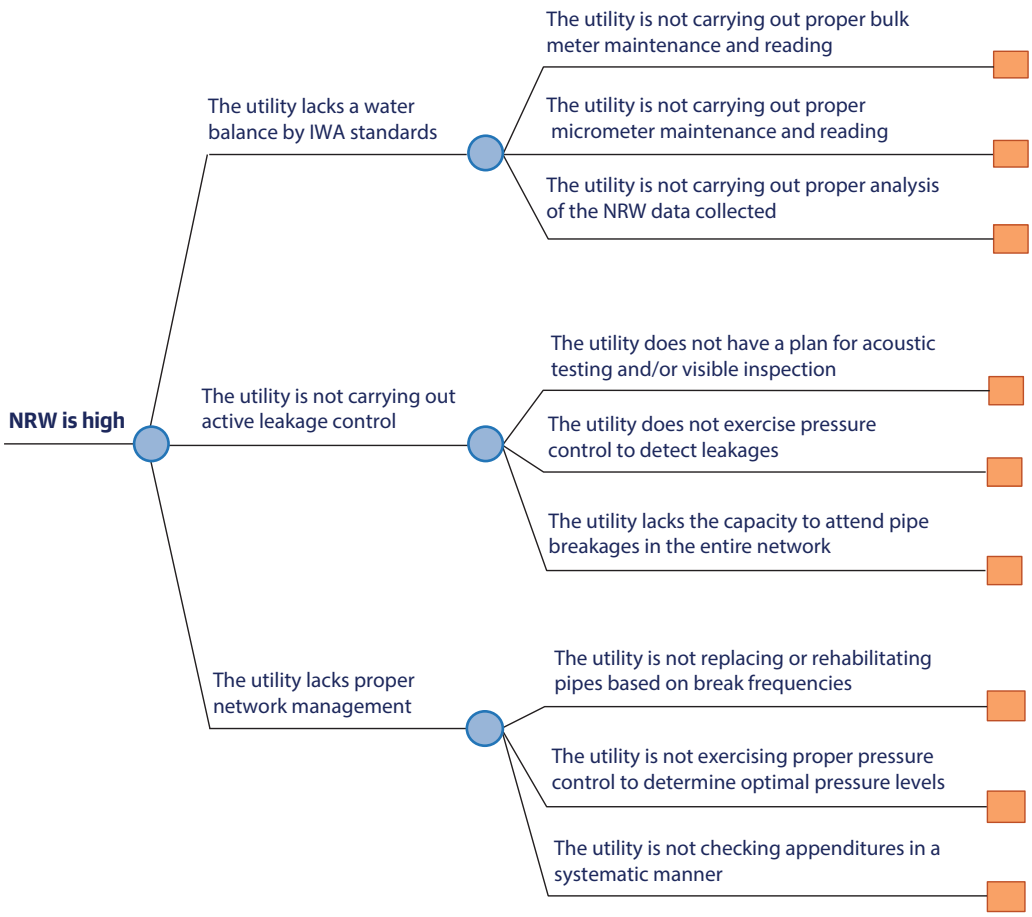
2. The second step requires **identifying any asymmetrical areas within the *individual* cobwebs**—that is, identifying the points in each cobweb that are significantly lower than the rest. Poor-performing areas typically house inefficiencies and promote ineffective practices that affect other areas of the utility.

Task 2: Identify Root Causes

The second task involves identifying the possible root causes behind poor performance or initial maturity. Utility managers can use logic trees to this end. The problem can be dissected into probable causes visualized as branches. Probable causes are identified by asking "why" and considering the assessment of performance and initial maturity. The branches of probable causes come from primary branches until arriving at the final possible causes, given the information available.

Figure 4.12 illustrates the application of a logic tree to the issue of high NRW. The logic tree shows nine possible terminal causes for high NRW. Each possible cause can be tested with data collected during the assessments in phase 0. The specificity of each terminal cause is directly

FIGURE 4.12. Logic Tree for High NRW



Note: NRW = nonrevenue water; IWA = International Water Association.

proportionate to the level and quality of the quantitative and qualitative data generated to test each branch. When detailed data are lacking, the trees should be adjusted to the level of data available.

Identifying root causes or strategic gaps will help utility managers think through broad problem areas and target specific issues that can be addressed through minor actions.

Task 3: List Preliminary Priority Actions

The third task involves defining preliminary priority actions for each focus based on the root causes identified in each logic tree. These actions can flow directly from the terminal causes in each logic tree. Managers can also use the action matrices to help them identify the actions to be taken.[12] Typically, just a few inputs or actions lead to the most outputs. Therefore, identifying those high-leverage actions will help maximize efficiency, which is particularly important when resources are scarce (Koch 2008).

Task 4: Filter Priority Actions

The fourth task involves filtering the preliminary actions—to identify the low-cost, high-impact actions most likely to increase credibility by considering and prioritizing other aspects. Utility managers can look at any number of contextual, political, social, or economic factors, such as:

- **Low cost.** Least-cost actions should be prioritized
- **High impact in the short term.** Actions that yield concrete results should be prioritized
- **Requiring low political capital.** Actions that require low levels of political capital should be prioritized
- **Having no negative effect on service quality.** Actions that have no *short-term* negative impact on service quality may be preferable.
- **Not requiring more decision-making autonomy than management enjoys.** If management understands exactly what decisions it can make, it will be easier to identify some *viable* options to choose from. For example, management may be *unable* to hire or fire people, but *able* to cut operating expenses. In such a case, the latter course of action—requiring less autonomy—may have to be prioritized.

The utility manager chooses actions that can be effectively implemented with the resources available, and in a short time frame. After choosing the priority interventions, the manager should communicate these to stakeholders, which will probably include government authorities, donors, and customers. To build credibility, it is imperative that the interventions succeed. Thus, ensuring that resources are available is essential to the manager's ability to deliver on the commitments made (box 4.5).

4.3.3 Step 1.3: Deliver on First Commitments

The third step of phase 1 is to carry out the commitments chosen in step 2 and deliver results. The utility manager must oversee the implementation of the chosen commitments to ensure they are carried out in the defined time frame.

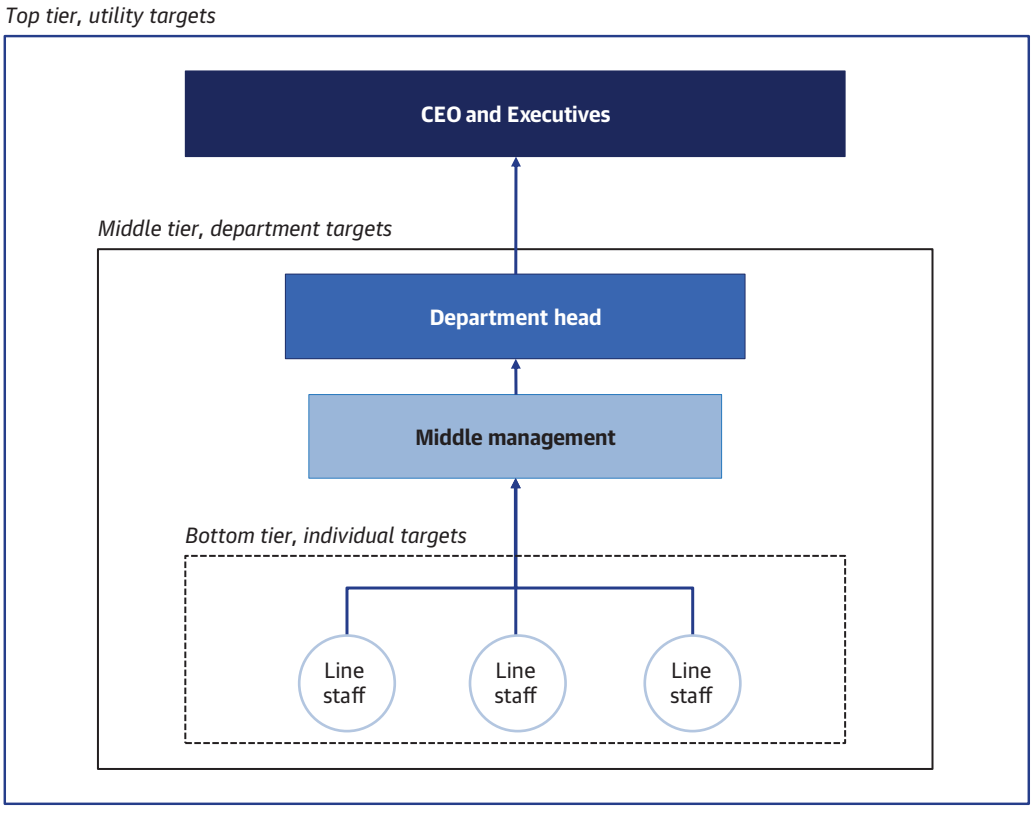
BOX 4.5. High-Leverage Actions in DAWACO

At the start of the turnaround, DAWACO carried out four small NRW reduction pilot programs. The first pilot began in February 2008 and involved 146 households. The second and third pilots covered 500 households and 2,000 households, respectively. The last pilot was implemented in an industrial area. These four pilots focused on reducing physical losses. All were successful and showed staff that small changes in day-to-day operations could greatly reduce NRW.

To oversee the implementation, the manager should set up a transparent system to monitor and evaluate progress. This system should have three components—a monitoring structure that assigns responsibility over actions to employees, a reporting structure that is transparent and builds accountability throughout the utility, and an incentive structure that motivates staff by rewarding those who meet the targets.

The monitoring structure is the core component of this system (figure 4.13). It assigns responsibility for specific actions to employees by linking actions to targets that are specific, measurable, actionable, realistic, and time-bound (SMART). Targets are set for the utility, for the

FIGURE 4.13. System for Monitoring Implementation



corresponding department within the utility, and for individuals directly involved in the process. This monitoring structure assigns responsibility in three tiers from the bottom up, producing a cascade effect. Line staff responsible for meeting individual targets make up the bottom tier of this structure. Managers responsible for meeting specific departmental targets form the middle tier. Higher-level executives who are ultimately responsible for meeting utility targets make up the top tier of the structure.

The reporting structure should mirror the bottom-up approach shown in figure 4.13. It should also use tiers to communicate the progress made by individuals to those in charge of monitoring their results, ensuring accountability and transparency. For example, line staff in the bottom tier should report on a weekly basis to an individual in the middle tier—middle management or the department head, if applicable. The latter then reports the progress made by the department to the CEO and other executives on a quarterly basis. This kind of structure ensures that reporting and evaluation are carried out in the same manner and with the same frequency across these three tiers of the utility.

The last component of the monitoring implementation system is the incentive structure, which is designed to motivate staff by rewarding those who meet targets. The incentive structure can take many forms. For instance, in cases where targets are related to collecting money owed by customers or to lowering costs, a utility could use a profit-sharing system—that is, the utility gives a small percentage of the money recuperated back to the employees who helped meet the target. The utility could also use bonuses or a prize system to award employees who design the most effective and efficient strategies to tackle specific problems.

This type of monitoring system will make it easier for a utility to meet its commitments and start creating virtuous cycles. For example, meeting a commitment typically helps improve financial performance. As commitments are met and the utility's financial situation improves, the manager will begin to gain credibility with staff and stakeholders (box 4.6). This will boost staff morale and allow the manager to start changing the corporate culture. Increasing credibility with stakeholders will lead to more decision-making autonomy for the utility.

When a commitment is met, the utility manager should communicate this widely. A high level of exposure will let a manager build credibility more quickly.

BOX 4.6. Delivering on First Commitments in CESAN

At the start of the turnaround, CESAN's newly appointed manager committed to stabilizing CESAN's finances. By focusing both on cutting costs and increasing revenues, CESAN started generating profits only 9 months after the manager had been appointed. With this credibility, the manager persuaded the governor to invest in CESAN and negotiate a repurchasing agreement to buy back CESAN's shares. The governor also supported the manager's decision to implement new management practices and thereby change CESAN's corporate culture and revitalize the company.

4.3.4 Step 1.4: Check Readiness to Proceed to Phase 2

The final step of phase 1 involves determining whether the space for change is large enough to begin implementing an action plan (figure 4.14).

To establish whether a utility is ready to start implementing an action plan, two questions must be answered:

- **Does the utility have a government champion and a competent manager with a minimum of autonomy?** When assessing the situation, the utility may have met some of the conditions needed for starting a turnaround (section 3.2). While only some conditions are necessary to begin phase 1, *all* conditions must be met to move on to phase 2. The utility will need a government champion who can help secure the resources to carry out an action plan and support the turnaround. Since the manager will also need sufficient autonomy to be able to make (difficult) decisions, it is also important that the utility have a supportive government champion.
- **Does the utility have the time, information, and financial resources required to develop an action plan?** A utility that does not meet the requirements to move on to phase 2 or 3 during the initial assessment should remain in phase 1. After delivering on commitments, the manager should complete the phase 2 checklist again to see whether the utility is ready for action planning in phase 2.

If either question cannot be answered affirmatively, phase 1 will have to be repeated more than once until enough space for change has been created.

Tools

- Maturity Matrices
- Action Matrices
- Phase 3 Checklist

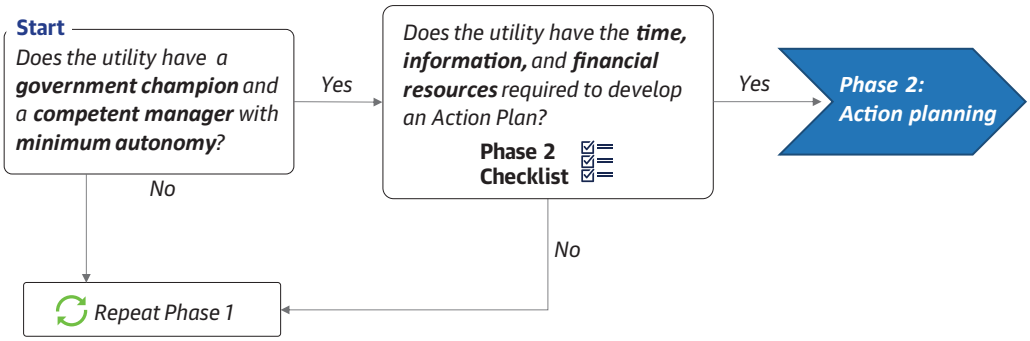
4.4 Phase 2: Action Planning

The purpose of this phase is to formulate and implement an action plan based on systematic, coordinated, and prioritized actions that will set the utility on a turnaround path. The action plan should be fully funded and include multiyear targets, allowing the utility to carry out the more costly and complex actions needed to continue its turnaround process. The manager will be using the tools and outputs shown to the right.

Outputs

- Maturity Cobweb
- Input for Action Plan

FIGURE 4.14. Decision Tree for Phase 2



Unlike phase 1, phase 2 requires greater "depth" of management expertise, with the middle management of the utility participating fully. It consists of five steps, listed in figure 4.15 and described in detail below.

At the end of phase 2, the utility should be ready to transition to *continuous* performance improvements. If the initial action plan cannot deliver this (because it still suffers from systemic failures that put it at risk of backsliding to a vicious cycle), the utility should revise the action plan and take steps until it achieves the required performance and maturity level.

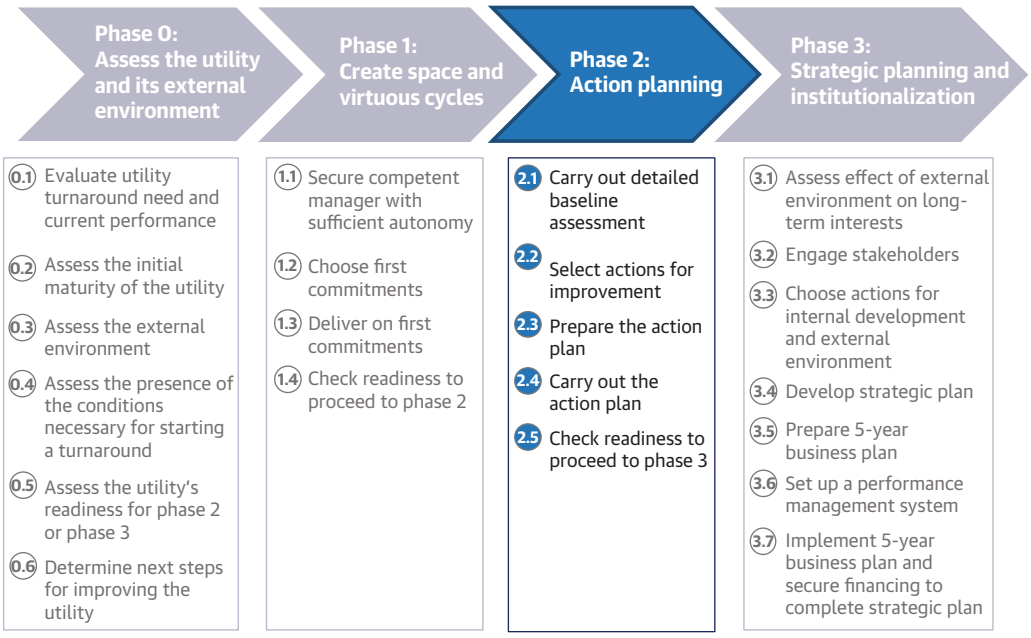
4.4.1 Step 2.1: Carry Out Detailed Baseline Assessment

The first step of phase 2 is for the utility's management to prepare a detailed baseline assessment. This assessment is the backbone of a business planning process: it provides an accurate, detailed, and comprehensive snapshot of the utility's condition and performance. This snapshot will allow the utility to set performance targets and estimate the cost of achieving those targets. It will also provide a reference point for comparison as the utility proceeds on its turnaround path.

This baseline assessment will require significant time, expertise, and resources. It generally takes 6–12 months and typically requires a multidisciplinary team. The utility may need technical and financial assistance from the government and/or donors for this assessment. Once it has been completed, management can use all the data generated to identify the areas needing improvement.

While carrying out the baseline assessment, the utility's management must continue implementing low-cost, high-impact actions. Continuing to make commitments and delivering on them allows the utility to further build credibility, autonomy, and accountability.

FIGURE 4.15. Steps to Develop and Carry Out an Action Plan



Some key outputs of the baseline assessment are the following:

- **Underlying data for the utility's financial model.** The detailed baseline will yield all the data required for building the financial model, which is essential for preparing the action plan. The model will have detailed historical values and multiyear projections of the utility's financial figures, fixed assets by type, staff, customers, demand, water balance, and key performance indicators. It will thus allow management to establish current conditions, targets for improvements, and the cost of achieving those targets.
- **Detailed and accurate water balance.** NRW has a significant impact on the utility's financial position and its capacity to deliver quality service. The detailed baseline should produce the most accurate water balance possible—that is, a top-down audit of the losses of the whole system, starting with the total system input.
- **Qualitative data for completing the detailed maturity matrices.** These matrices will provide a comprehensive understanding of each element's maturity.

With these outputs, the utility's management will have the inputs needed to develop the action plan. In addition to producing the above outputs, a baseline assessment will generally also include the following data-yielding activities:

- **Data collection.** An assessment starts by gathering available data on WSS infrastructure, service levels, income, and other demographic indicators, and researching relevant legislation, policies, and government strategies and documents.
- **Field surveys.** Field survey trips include interviews with all bodies that have responsibilities in the sector, directly observing processes at WSS facilities, mapping infrastructure, assessing O&M arrangements, and sketching water treatment and sanitation facilities and processes.
- **GIS mapping.** For utilities with the necessary technology, all WSS infrastructure should be mapped in GIS and include the best-available information from existing sources, as well as the results from field survey sketches.
- **Household surveys.** Customer enumeration surveys are conducted using GIS maps and should include all households, businesses, and organizations in the service area. Surveys should collect at least the usual number of people in each household, disaggregated by gender and age; the status of WSS coverage; reliability, quantity, and quality of service; and the status of the household meter.
- **Water quality testing.** Water quality should be tested in at least 5 percent of households in the service area by taking a sample at the point of delivery and another at the point of use.

Multiple tools are available to assess these specific aspects of water utilities, from organizations such as the World Bank and IWA. For example, the World Bank has a detailed Operational Manual that describes the process for planning and implementing NRW-reduction projects in water utilities, including carrying out a baseline assessment (World Bank 2018; World Bank 2016b).

In the detailed baseline assessment, the maturity of each element of the utility's operational and managerial capacity should be evaluated—using the maturity matrices developed for each of the five elements of the success pyramid: Financial Management, Human Resources Management, Organization and Strategy, Commercial Operations, and Technical Operations. As in the case of

the initial maturity matrix, each element should be assigned a maturity level ranging from 1 (elementary) to 5 (world-class). The five maturity matrices are presented in Appendix A.

After determining the maturity of each element, the results should be mapped to a maturity cobweb (figure 4.16 represents a maturity cobweb for a hypothetical utility). The utility's management should use this cobweb to identify priority areas and activities for the action plan. The maturity cobweb is based on a more in-depth analysis than the one underlying the initial maturity cobweb (section 4.2.2).

4.4.2 Step 2.2: Select Actions for Improvement

The second step of phase 2 is to select the actions targeting improvement for the action plan by applying a set of guiding principles and using the action matrices. In this step, it is best to use a highly participatory approach with the utility's staff to increase corporate ownership of the action plan. Using the maturity cobweb from step 2.1, management should select the priority actions by sequentially applying the five guiding principles shown in figure 4.17.

Guiding Principles for Identifying Priority actions

Seek balance in the maturity cobweb. Management should begin to identify the priority areas and actions in the action plan by applying this principle first. It indicates that the plan should focus on areas where the utility has the *lowest* maturity levels. Figure 4.17 illustrates the application of this principle to a utility with the maturity levels shown in the maturity cobweb of step 2.1 (figure 4.16). Since the utility's lowest maturity levels are in HRM, Financial Management, and Technical Operations, the utility's action plan should focus on those areas.

Emphasize staff capacity. After identifying the focus areas, management should apply this second principle. The turnaround case studies highlight the benefits of focusing on

FIGURE 4.16. Example of a Maturity Cobweb for a Hypothetical Utility

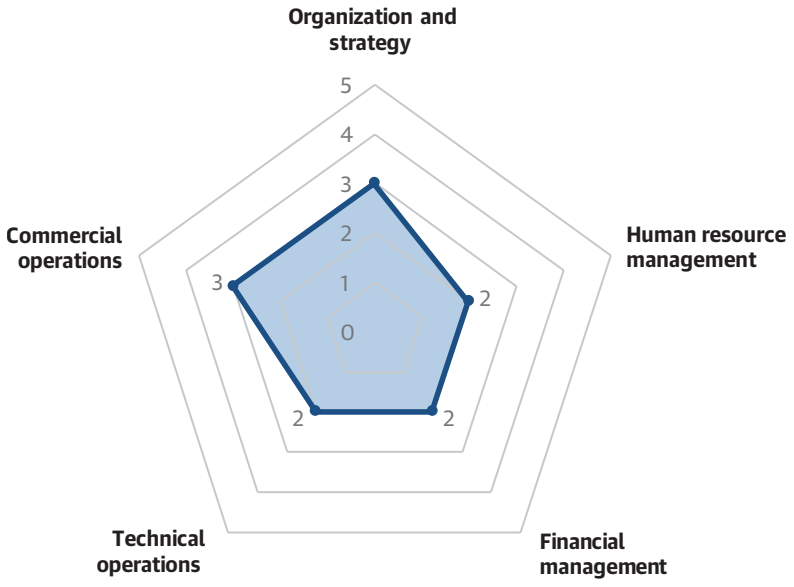
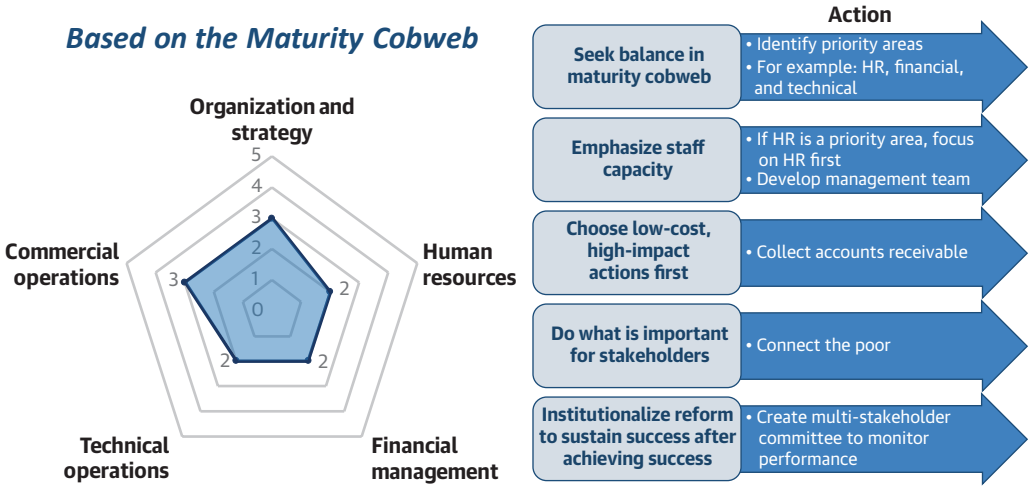


FIGURE 4.17. Guiding Principles for Identifying Priority Actions



Note: HR = human resources. The focus areas in the action plan for a utility with this maturity cobweb should be HRM, Financial Management, and Technical Operations.

human resources at the beginning of a turnaround (box 4.7). This principle indicates that HRM should always be a focus area in the action plan, unless the utility has high maturity in it. For the utility with the maturity cobweb shown in figure 4.17, improving HRM would be the top priority of its action plan. This means the utility may have to engage external stakeholders that affect personnel management, such as labor unions. Designing and implementing proactive strategies for engaging with the labor union would then be a priority action for the utility.

Choose low-cost, high-impact actions first. Once the priority areas of focus have been identified, management should apply this principle in a way similar to the approach used to select the initial short-term commitments in phase 1 (section 4.3.2). In both cases, the most cost-effective actions should be prioritized. In phase 2, however, the actions prioritized are likely to require more time, data, and money than in phase 1. In phase 2, for example, planning has a longer time horizon (in phase 1 actions for a 12-month plan should be selected, in phase 2 actions for a 3-year

BOX 4.7. Developing Human Resources in ONEA

One of the first actions taken by ONEA's newly appointed manager was to implement the staffing plan recommended by the German Technical Cooperation Agency (GTZ) and the Danish International Development Agency (DANIDA). The manager worked closely with unions to negotiate severance payments and reduce the number of underperforming staff. He also met with all department directors to identify and dismiss unqualified directors. At the end of the process, 180 underperforming employees had been retired, redeployed, or dismissed.

plan). In addition, in phase 2 the utility will have more and more detailed data available after conducting in-depth baseline studies and probably also more resources to carry out actions requiring higher-cost investments.

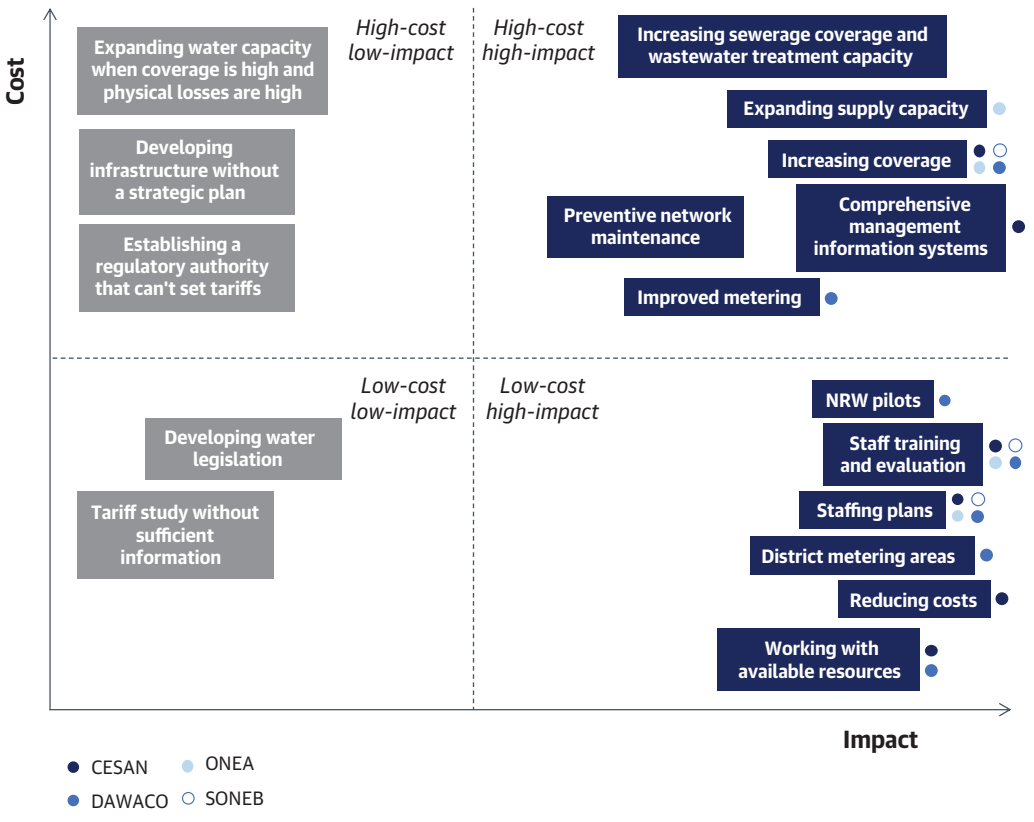
Management can use the action matrices to select the actions with the highest impact in the respective focus areas, considering the time and money available for them. The action matrices list actions the utility can take to improve maturity and performance (appendix B and section 4.1.2).

As in phase 1, the actions can be carried out in-house or outsourced to private operators. Utilities without the internal capacity to implement a given action should consider outsourcing the implementation of that action to a specialized firm.

Figure 4.18 shows some high-leverage actions taken by the successful case study utilities during their turnaround. For comparison, examples are also given of high-cost, low-impact, and low-cost, low-impact actions that the case studies did *not* consider.

Utilities with good capacity may have sufficient resources to consider actions beyond those indicated by the first three principles. In this case, management should also apply the fourth and fifth guiding principles when developing their action plan.

FIGURE 4.18. High-Leverage Actions



Do what is important for stakeholders. This principle indicates that the utility should include actions important for stakeholders in the action plan. By doing so, the utility will be more likely to benefit from the support these stakeholders can provide. To identify the stakeholders' interests, the utility needs to engage the stakeholders relevant to its priorities.

For example, if achieving financial sustainability is a priority, the utility may want to facilitate the establishment of a predictable regime for setting tariffs in the future. To achieve this, it must probably engage its economic regulatory authority. The latter will certainly have priorities regarding the utility and the water sector at large—for instance, good value for money for customers and excellent service standards. At this stage, the utility needs to identify those priorities and start engaging the authority, for example, by presenting a draft of its action plan and showing how its overarching objectives align with those of the authority.

Though the utility will probably not have the level of credibility to push for major changes to its external environment, in phase 2 it can plan and execute actions that will later provide it with more leverage to influence exogenous factors in phase 3 (section 4.5).

Institutionalize reform to achieve sustainable success. This principle will most likely be applied by utilities in phase 3 rather than this phase. As it is only relevant after a utility has successfully achieved major performance improvements, it will apply to very few utilities in phase 2.

4.4.3 Step 2.3: Prepare an Action Plan

The third step of phase 2 is to prepare the action plan, using the detailed baseline developed in step 2.1 and the actions selected in step 2.2. The expected duration of the action plan will vary depending on the utility's maturity, current performance, and availability of funding. In most cases, implementation of the action plan will take about 3 years, which allows enough time to carry out significant improvements. The action plan should include these key items:

- **Targets to be met.** Management identifies the specific annual targets to be achieved. These targets should be measurable, precise, time-bound, and assigned to specific units or departments of the utility.
- **Estimated cost.** Management estimates the cost of meeting the targets by building a financial model with inputs from the baseline assessment carried out in step 2.1. The financial model should accurately capture the baseline, and project the operating and capital costs for the utility, using a set of assumptions about the desired performance targets.
- **Financing plan.** The action plan cannot be carried out without securing the total funding required to meet the targets. Insufficient funding would compromise efforts to increase credibility, autonomy, and accountability. The utility's management is responsible for securing the required funding.
- **Mechanism for monitoring the results.** A mechanism for monitoring and communicating the results of the action plan is essential. This mechanism will increase the utility's accountability.

Since the utility will probably need funding or support from the government to carry out the action plan, it should agree on targets with the government, as well as any financial support

required to cover the cost of the plan. Making and fulfilling this agreement with the government will formalize the utility's increased accountability and autonomy. Achieving the targets according to the plan's timetable will increase the utility's credibility.

4.4.4 Step 2.4: Carry Out the Action Plan

After securing funding, management should begin making the improvements set out in the plan. It should designate departments responsible for achieving each target and allocate resources accordingly.

Department managers and staff should be committed to meeting their targets. Staff performance should be closely monitored, preferably through a performance evaluation system. If compensation is not yet performance-based, staff can be incentivized in other ways to perform—for example, through bonuses, specialized training, or a collective reward.

As soon as actions begin, they should be closely monitored. Each department should have a clear mechanism to monitor performance, and actual performance should be regularly compared against targets. Ideally, management meets quarterly to review performance against targets and adjust resources accordingly (see box 4.8 for an example of this in a utility that achieved a successful turnaround). When performance is below target, management must adjust resources or responsibilities.

How effectively the plan is carried out will depend on management's ability to adjust resources and ensure that actual performance meets projected targets.

4.4.5 Step 2.5: Check Readiness to Proceed to Phase 3

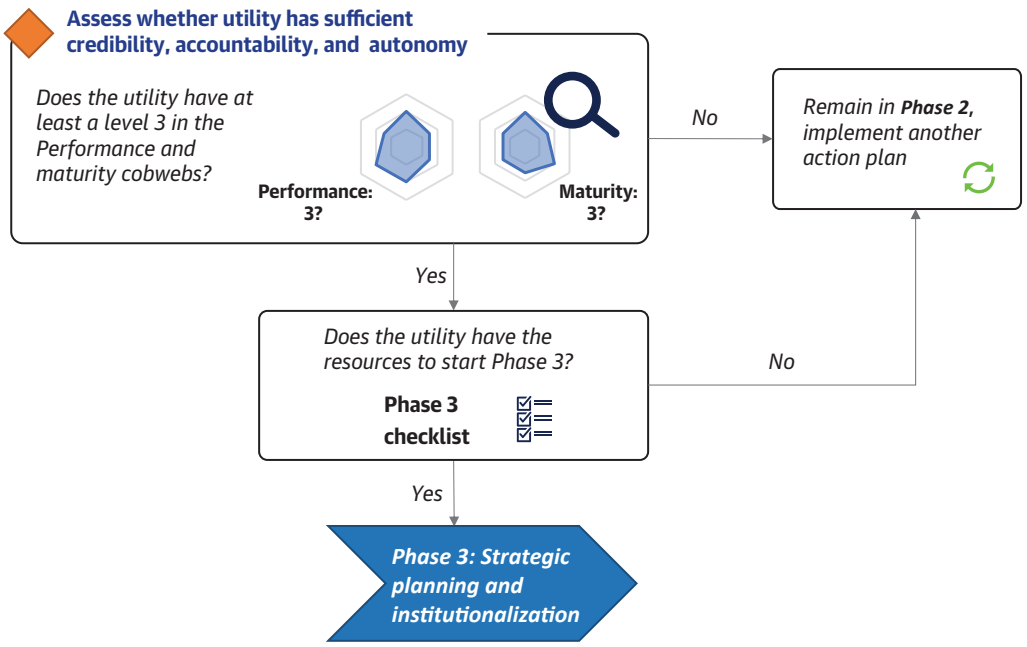
The fifth step of phase 2 is to determine whether the utility is ready to proceed to the next challenge: to institutionalize practices that sustain performance. As the end of the action plan approaches—say, 3 to 6 months before the end—the utility's management should check whether it is ready to proceed to phase 3.

The utility is likely to have sufficient credibility, accountability, and autonomy for phase 3 once it has achieved level 3 or above in the performance and maturity cobwebs. At that point, it will have implemented enough low-cost, high-impact actions to achieve institutionalized levels of performance and maturity. Figure 4.19 illustrates the management decision process at the end of phase 2.

BOX 4.8. Measuring Performance in CESAN

CESAN monitors performance against its targets monthly. Each strategic indicator is assigned to the department specifically responsible for implementing the initiative. Results are published monthly and clearly show progress against the previous month and overall quarter.; they are posted on each department's bulletin board as a daily reminder.

FIGURE 4.19. Decision Tree for the Final Step of Phase 3



In a nutshell, phase 2 is about achieving the initial turnaround. The challenge in phase 3 is to ensure that the utility does not slide back but moves toward successful operation in an environment where it is no longer constrained by exogenous factors; it can start pursuing continuous improvements and begin implementing an investment program that will allow it to achieve its long-term goals.

If the utility has met the seven requirements on the phase 3 checklist (box 4.4), it is probably ready to move on to phase 3 but otherwise, the utility will have to repeat phase 2 until it does meet them all.

4.5 Phase 3: Strategic Planning and Institutionalization

This final phase aims to move from initial actions for improvement to a strategic plan that institutionalizes and sustains the improvements realized. It should facilitate the switch away from focusing on *short-term* measures to fix the most glaring problems toward institutionalizing improvements that sustain successful performance. The manager should carry out this phase using the tools and outputs shown to the right. Phase 3 consists of seven steps (figure 4.20), elaborated later in this chapter.

Tools

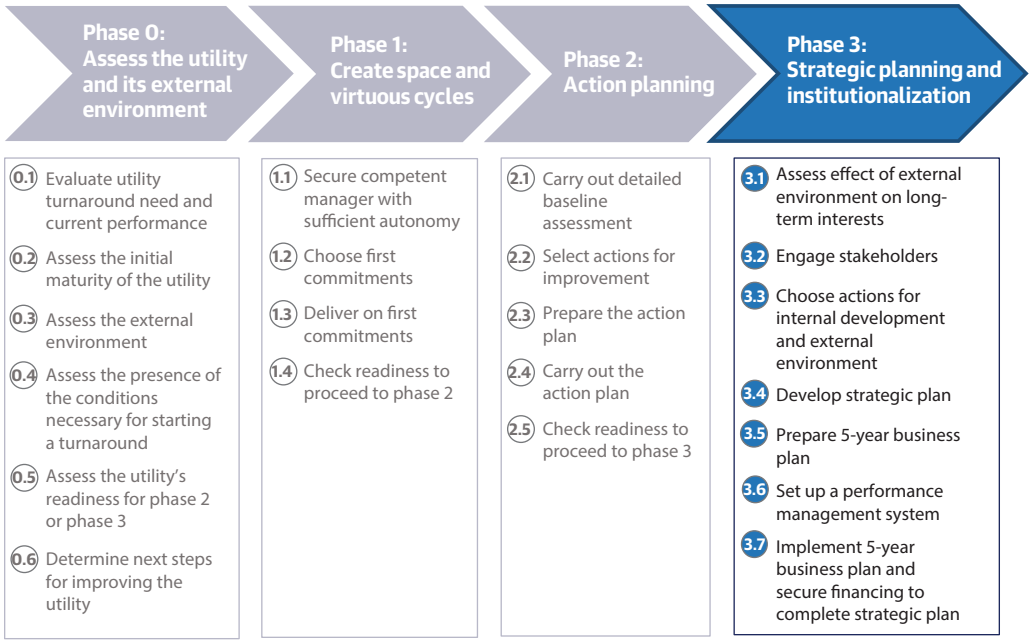
- Maturity Matrices
- Action Matrices

Outputs

- Maturity Cobweb

To become a world-class performer, the utility should design a two-track strategic planning approach—the first track focusing on improvements that solidify internal development, and the second track focusing on engaging and cooperating with stakeholders who may affect the utility's long-term interests. Moreover, the approach should establish a *long-term* strategic vision (looking at least 15 years ahead), supported by a strategic plan.

FIGURE 4.20. Steps to Design and Implement a Strategic Plan



Most utilities starting in phase 3 will require significant time and resources to achieve ambitious objectives such as meeting the SDG for drinking water and sanitation (SDG 6). To ensure that the long-term strategy is implemented, the utility should prepare 5-year business plans that segment the strategic plan.

Sustaining improvements to reach world-class performance will require longer-term, higher-cost capital investments, and dedicating resources to proactively influence the external environment. In addition, the utility should have discernible levels of good maturity and performance at the beginning of this phase—scoring at least a 3 (= good) in both performance and maturity,[13] and have the vision and ambition to aim for excellence.

To ensure that the external environment fosters successful performance, the utility should start advocating its long-term interests:

- **Regulatory stability**. The utility should make sure that the regulatory framework in place allows it, for the foreseeable future, to cover all costs of providing the expected service, with a revenue stream that can be predicted accurately and reliably. To meet this objective, the regulatory framework will need to have a robust mechanism for setting and adjusting tariffs, clearly defined performance standards that are not subject to frequent or arbitrary changes, and transparent accountability mechanisms for enforcing standards.
- **Labor stability.** The utility should make sure that it can rely on a pool of competent, capable staff subject to high performance standards. To meet this objective, the labor market should supply qualified individuals, and labor regulations should incentivize good performance.

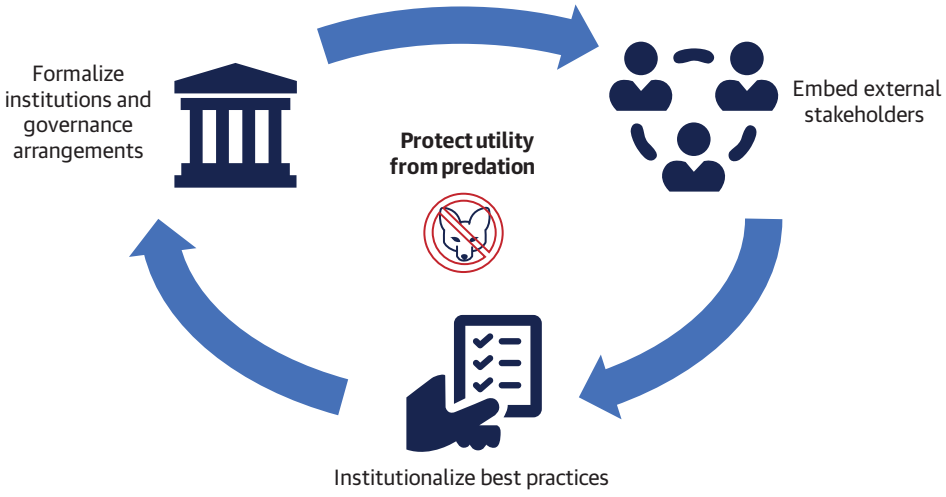
- **IWRM.** The utility should make sure that it will be able to meet all projected demand with a safe and least-cost source of supply. The utility will need to cooperate closely with entities that manage the water resources it relies on, to ensure long-term water supply.
- **Financial sustainability**. The utility should make sure that it can readily access the financing required for the capital investments needed to maintain high levels of access to WSS, quality of service, and operational efficiency. It can achieve this objective with strong financial performance, transparent financial reporting, and by ensuring that it uses financing efficiently and effectively. Ultimately, if a utility can pay the cost of capital, it will have access to the capital it requires.
- **Deep and broad customer satisfaction**. The utility needs to ensure that customers consistently find that it is the best and least-cost source for providing WSS services. This will generate strong customer support and ensure that its fixed asset base remains productive. The utility's customers will be satisfied if it prioritizes a customer focus, maintains a high level of service quality, and communicates directly and frequently with them.

Figure 4.21 shows how influencing the external environment proactively—by formalizing institutions and governance arrangements and embedding external stakeholders—helps protect from predation.

4.5.1 Step 3.1: Assess Effects of External Environment on Long-Term Interests

The first step in phase 3 is to assess the effect that the external environment could have on the utility's long-term interests. Exogenous factors can compromise the utility's goal of successful performance. The relevant stakeholders for those factors were identified in phase 0 and engaged in phase 1 and phase 2, as appropriate.

FIGURE 4.21. Protecting the Utility from Predation



In this step, the utility should assess the external environment's potential effect on each of its long-term interests—regulatory stability, labor stability, IWRM, financial sustainability, and deep and broad customer satisfaction. For each long-term interest, the utility should evaluate the following:

- **What is the current environment like?** In this context, this refers to the current norms and circumstances pertinent to each long-term interest. For example, for regulatory stability, it should evaluate the relevant rules and practices for setting tariffs and performance standards. While performance standards may be clearly defined, the rules for setting tariffs may be harmful to the utility's long-term interests
- **What alternatives can fix harmful aspects of the environment?** After identifying the rules and practices that may be detrimental to each long-term interest, the utility should consider how to resolve those harmful aspects. For example, if the rules for setting tariffs need to be changed, the utility may consider working with the regulator to reform the tariff-setting framework or working with the sector ministry to reform legislation on tariff setting. Identifying possible alternatives will allow the utility to strategically pursue the approach that is most likely to succeed.

4.5.2 Step 3.2: Engage Stakeholders

The second step of phase 3 is to develop strategies to engage all stakeholders who shape the utility's external environment.[14] After examining alternatives to resolve the harmful aspects of its external environment, the utility should engage all stakeholders with control or influence over the realization of its preferred alternatives.

In this step, the utility should design strategies to engage stakeholders. It should start by capitalizing on stakeholders it engaged in previous phases. For example, the utility may have engaged the regulator in phase 2 by presenting a draft of its action plan for comments and to set up an accountability system (section 4.4.2). In this step, the utility would engage the regulator more *proactively* to start securing its long-term interest of regulatory stability.

After capitalizing on its relationships with previously engaged stakeholders, the utility should also engage the stakeholders whose cooperation it needs to secure its long-term interests (table 4.4).

Engaging the relevant stakeholders can take various forms, such as embedding or lobbying a certain stakeholder. The type of engagement will depend on the means deemed most effective to achieve a desired outcome. For example, if the utility believes that a new law is the best way to reform the tariff-setting regime, then lobbying the government, rather than embedding it, would be the best type of engagement.

4.5.3 Step 3.3: Choose Actions for Internal Development and External Environment

The third step is to choose the actions for the strategic Plan that will foster internal development and influence the external environment. Considering its long-term interests and current levels of performance and maturity, the water utility should use guiding principles to select actions for the strategic plan. The guiding principles for internal development should help the

TABLE 4.4. Typical Stakeholders Affecting Long-Term Interests

Long-Term Interest	Typical Stakeholder
Regulatory stability	Government Regulator Labor stability
Labor unions	Labor department Licensing agencies Education department
Integrated water resources management	Government Water management authorities Municipal government Urban planning department Environmental agency
Financial sustainability	Government Regulator Commercial banks Credit rating agencies Institutional investors Development banks
Deep and broad customer satisfaction	Consumer associations Large customers Customer committees

utility select actions to institutionalize practices, processes, and procedures for each element of the Success Pyramid. Moreover, they should help the utility consider making larger capital investments than it may have considered in previous phases.

Guiding Principles for Internal Development

The three guiding principles for internal development are:

1. **Institutionalize first what has worked best.** The utility should select actions to institutionalize best practices in the element of the Success Pyramid where it has already substantially improved its maturity during its turnaround. For example, if the utility revolutionized its HRM during the turnaround, it could institutionalize the practices that led to those improvements. These actions are likely to cost less than actions in other elements of the Success Pyramid where progress was not as significant. The utility will probably be able to carry them out in the first business plan that forms part of the strategic plan.
2. **Institutionalize the remaining elements of the success pyramid.** The utility should then select actions for institutionalizing best practices in every other element of the success pyramid. These actions are likely to require more resources, and the utility may be better placed to finance them in subsequent business plans.
3. **Develop capital investments to achieve world-class performance.** The utility should then select actions to develop larger capital investments, focusing on those that will directly help achieve world-class performance.

Guiding Principles for External Development

The guiding principles for influencing the external environment should help the utility select actions based on the alternatives examined in steps 3.1 and 3.2, beginning with those that require the least amount of resources and social capital. The five principles are:

1. **Choose actions that require little social capital first.** The utility should select actions where it can use existing relationships to cooperate with stakeholders. These stakeholders are likely to have been engaged in phases 1 and 2, so less social capital would be needed than for stakeholders not engaged in either or both of those phases.
2. **Choose actions for embedding formal structures.** The utility should select actions that entail embedding other stakeholders and engaging in formal structures with them. Embedding other stakeholders increases transparency and invites stakeholders into the strategic planning process. This helps build new relationships with stakeholders whose cooperation will be necessary in the future.
3. **Choose actions for active engagement.** Once the utility has engaged with stakeholders who require little social capital, and who could be invited into the strategic planning process, it should engage stakeholders whose direct cooperation is essential for overcoming harmful aspects in the external environment. For example, in previous phases the utility may not have engaged the environmental agency responsible for managing the basins that supply its water. In this step, the utility could decide to actively engage the environmental agency to design a sustainable management program that would ensure the quality and supply of water for the next 20 years.
4. **Choose actions to increase financial sustainability.** The utility should select actions that will increase its creditworthiness and attract financiers. Improving internal financial management will help increase creditworthiness (by producing reliable financial data), but the utility will have to be proactive about showcasing its investment potential and attracting financiers that would not otherwise invest in its strategic plan. These actions could include roadshows of the proposed capital investments.
5. **Choose actions to lobby for desired legal framework and policy changes.** The utility should choose the legal framework and policy changes it wants to pursue and determine the necessary lobbying to help facilitate them. Lobbying is probably the costliest and most time-consuming way to influence the external environment. The utility should plan its lobbying toward the end of the first business plan in phase 3, or later, to ensure that it has the political clout to lobby successfully.

At this stage, the utility can also use the action matrices (appendix B) to select relevant actions for the strategic plan. These actions should be selected from the matrices aiming to improve utilities either at level 3 (good) or level 4 (well-performing).

4.5.4 Step 3.4: Develop a Strategic Plan

The fourth step is to develop a strategic plan, based on the outputs of the previous steps in phase 3 (box 4.9). The strategic plan typically covers 15-20 years and should explicitly describe all the utility's long-term objectives. Utilities aspiring to world-class performance aim for universal coverage, excellent operational efficiency, and financial sustainability.

BOX 4.9. Developing a Long-Term Vision in DAWACO

DAWACO prepared a long-term vision with the aim of universal access, including for poor households. This vision was translated into 5-year targets with the required budget to connect 16,000 households a year, of which 2,000 were poor households. By installing 2,000 connections for poor households every year, DAWACO hoped to service 14,000 new households between 2008 and 2015, reaching approximately 50 percent of all urban poor households.

To plan how to achieve long-term objectives, the utility needs to project its operations into the strategic plan's proposed duration. At this stage, the utility should use more sophisticated techniques to forecast demand, supply, and financial indicators. This will allow for time-sensitive risks that may affect the utility's ability to achieve its objectives.

The management of the utility should also focus on securing consensus and support from all areas of the utility. The utility may struggle to sustain success if certain internal groups oppose the management's vision. This step is key to secure success, so it must be addressed by the utility's top and middle management. Reasons for opposing the utility's vision can be political, economic, ideological, or even personal. Therefore, management needs to address opposition on a case-by-case basis to ensure that it can ultimately reach consensus.

4.5.5 Step 3.5: Prepare 5-Year Business Plans

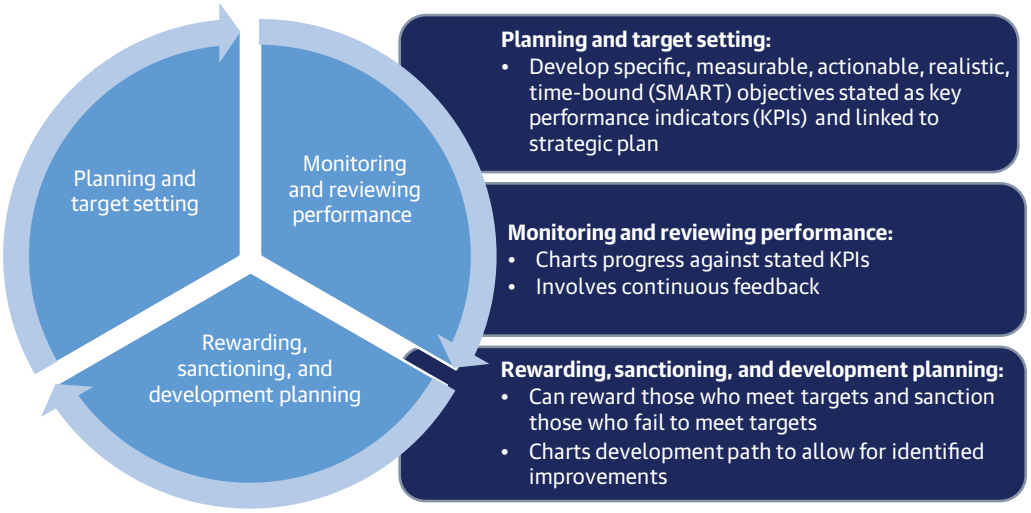
Once the strategic plan is ready, the utility should segment it into 5-year business plans for implementation. For example, a 20-year strategic plan should be developed into four 5-year business plans. The specific actions included in the first business plan should be selected based on the relevant guiding principles for internal and external development. Here the utility can also use the action matrices (appendix B) to review the estimated cost of each action. This will allow the utility to prioritize correctly the actions included in its first 5-year business plan.

4.5.6 Step 3.6: Set Up a Performance Management System

Every utility has to incorporate continuous improvement and learning curves as it develops.[15] To this end, in this step of phase 3, the utility's management should develop a performance management system to ensure that the utility can monitor, review, and (if necessary) adjust the strategic plan during its implementation. The proposed performance management system is an iterative process with the following key components (figure 4.22):

- **Planning and target setting.** Management should develop specific, measurable, actionable, realistic, time-bound (SMART) objectives stated as key performance indicators. These should be derived from the utility's overarching strategic objectives.
- **Monitoring and reviewing performance.** Utility management should develop a well-defined and transparent process for reviewing and evaluating progress against key performance indicators. This ensures that evaluation is carried out in the same way and with the same frequency across the organization.

FIGURE 4.22. Three Stages in the Performance Management Process



- **Rewarding, sanctioning, and development planning.** For the performance review to be effective, staff must be monitored. Management needs to determine how to reward staff who meet targets, and how to sanction employees who fail to meet them.

4.5.7 Step 3.7: Implement 5-Year Business Plan and Secure Financing for Strategic Plan

The utility should start implementing its first 5-year business plan (which should also mark the start of its strategic plan) once it has enough resources to cover the estimated costs of the first business plan, and of half the costs of the second business plan. Securing this amount of funding will ensure that the utility can continue planning for any subsequent business plans. The utility should start planning for the next 5-year business plan 6 to 12 months before the end of the plan currently being implemented.

This turnaround framework considers a turnaround to be completed once a utility has secured finance for its second 5-year business plan without assistance from external entities, such as donors.

Notes

1. These elements are organization and strategy, technical operations, commercial operations, financial management, and human resource management (HRM).
2. Section 4.2.1 elaborates the performance table and cobweb and its role in the framework.
3. Section 4.2.2 elaborates the initial maturity matrix and cobweb and their role in the framework.
4. Section 4.3.2 describes the action matrices and their role in the framework in more detail. The action matrices themselves are presented in appendix B.
5. Phase 0 was piloted in two water utilities—the Water Utilities Corporation (WUC) in Botswana and Can Tho Water Supply and Sewerage Company (Wassco) in Vietnam. Phase 0 was updated to reflect the lessons learned from these pilots. More details on the pilot projects and the assessment and strategies developed for each water utility are given in appendix C.
6. For more information, see "Transforming the Management of Water and Sanitation Utilities" at http://aquarating.org/en/.

7. In Step 0.6, the next steps of the utility are decided. What phase of the framework a utility can proceed to does not depend on the results of performance and initial maturity. Instead, it depends on whether various key factors—such as a government champion, a competent manager, and management being able to devote time to strategic planning—are present (section 4.2.6).

8. Harvey balls are round ideograms used to communicate qualitative information visually. They provide a range from 1 to 5 to show the relevance of each aspect of the external environment. A range 4 indicates a high level of relevance, while a range 1 indicates a low level of relevance. A 0 indicates that this aspect is irrelevant for the utility at that point in time.

9. A utility manager must generally be responsible for the most important decisions—staffing, prioritizing areas of improvement, allocating existing resources, and leading interactions with government and other stakeholders.

10. See table 4.2 for the performance table and appendix A for the maturity matrices.

11. Phase 1 was piloted at WUC in Botswana and Can Tho Wassco in Vietnam. Phase 1 was subsequently updated to reflect best practices and strategies for selecting priority activities and monitoring implementation. More details on the pilot projects and the assessment and strategies developed for each water utility are given in appendix C.

12. The action matrices are designed to select actions for improvement in Phase 2; they provide indicative actions for enhancing maturity and performance. These actions require more time, money, and information than will probably be available in phase 1. Even so, they can provide general guidance for choosing low-cost, high-impact actions (section 4.4.2 explains the matrices in more detail and appendix B presents the action matrix for each element of the utility).

13. See table 4.2 (performance table), table 4.3 (initial maturity matrix), and appendix A for the maturity matrices.

14. Locussol and van Ginneken note that "the performance of a WSS [water supply and sanitation] service provider is obviously influenced by its corporate governance and the environment it operates in. Too often the functions of policy formulation, regulation of the WSS service, ownership of WSS assets, financing of WSS infrastructure development and provision of WSS service are governed by unclear and unenforceable mandates and/or contracts" (Locussol and van Ginneken 2010, 1).

15. This process is described by the Deming Cycle as four repetitive steps for continuous improvement and learning: Plan, Do, Study (Check), and Act.

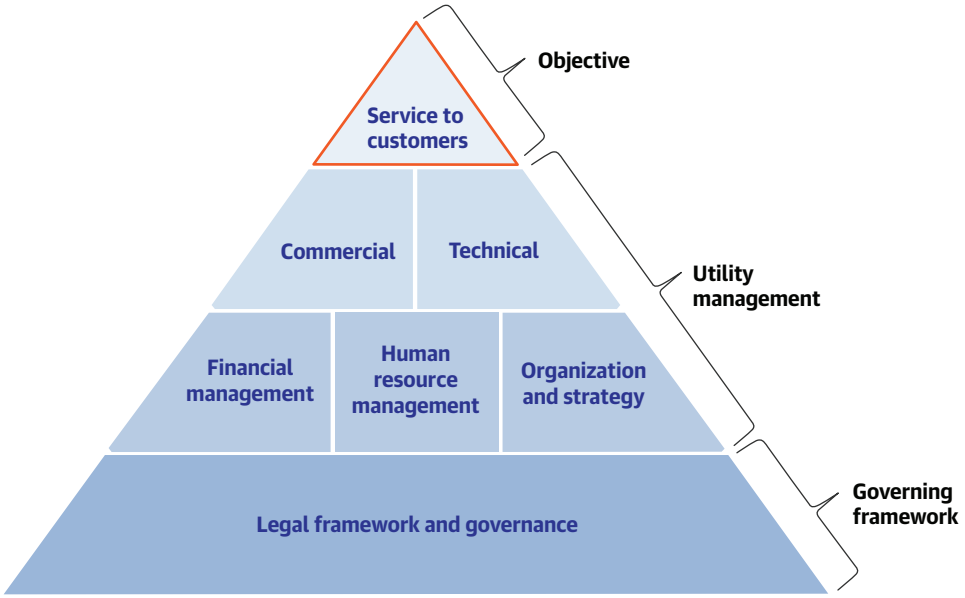
PART III

APPENDIXES

APPENDIX A
Maturity Matrices for the Elements of the Success Pyramid

This appendix presents the five matrices needed to assess a utility's maturity, based on each management area/element of the success pyramid (figure A.1). The matrices use descriptors to assign each element an absolute maturity level ranging from 1 (elementary) to 5 (world-class). Utilities should have every descriptor at a given, identical maturity level to qualify for that specific level.

FIGURE A.1. The Success Pyramid



Source: Adapted from Heymans et al. 2016.

This appendix presents the following tables:

Table A.1: Maturity matrix for organization and strategy
Table A.2: Maturity matrix for human resource management (HRM)
Table A.3: Maturity matrix for financial management
Table A.4: Maturity matrix for technical operations
Table A.5: Maturity matrix for commercial operations.

TABLE A.1. Maturity Matrix for Organization and Strategy

1	2	3	4	5
Elementary	**Basic**	**Good**	**Well-Performing**	**World-Class**
• Utility does not have a mission and vision • Utility does not have a business plan • Deficient management team • No strategy • No reporting • No defined organizational structure • Few stable processes exist or are used • Limited use of technology and systems	• Utility has a mission and vision • Utility has an annual business plan that is being implemented • Capable utility manager but weak middle management • Strategy for some activities • Monthly reporting • Organizational structure is defined • Basic processes and procedures in place • Basic technology and systems in place, and in use	• Utility has a mission and vision that is shared by all staff • Utility has a multiyear business plan that is being implemented • Capable management team • Some departments have a strategy that is documented, updated regularly, and implemented • Reports on the utility's management are prepared at least once a year and include indicators that measure key aspects such as access to service, service quality, operational efficiency, and financial sustainability • Organizational structure is updated regularly to reflect changing needs • Key utility processes are defined and managed • Integrated IT systems and operational systems and tools are in place	• Utility has a mission and vision that are shared by all staff • Utility has a fully funded, multiyear business plan that is being implemented • Very good management team • All departments have a strategy that is documented, updated regularly, and implemented • Reports on the utility's management are prepared at least once a quarter and include indicators that measure key aspects such as access to service, service quality, operational efficiency, and financial sustainability • Organization structure supports effective and efficient processes • Process planning is integrated with strategy development • Integrated IT systems and operational systems and tools are in place • Capital budget based on multiyear capital improvement plan, including maintenance expenses, updated annually • Strategic objectives are defined for a period of at least 5 years for the key performance areas prioritized through analysis of strategic options • Specific objectives associated with each of the strategic objectives, and with the respective goals and deadlines, are identified • Measures, mechanisms, and indicators exist for assessing the strategy's degree of success	• Utility has a mission and vision that are shared by all staff • Utility is implementing a strategic plan to help achieve SDGs within 10 years • Excellent management team • Reports on the utility's performance are prepared at least once a quarter and include indicators that measure key aspects such as access to service, service quality, operational efficiency, and financial sustainability • Structure enhances positive engagement with customers and other stakeholders • Processes are continuously and systematically improved • New technologies are proactively pursued and deployed • Measures, mechanisms, and criteria exist for assessing the strategy to provide the means of assessing the plan's degree of success

Source: Author's elaboration, including adaptations from IWA-WUEAM; AquaRating; and Kayaga, Mugabi, and Kingdom 2013, 25.
Note: IT = information technology; SDGs = Sustainable Development Goals.

TABLE A.2. Maturity Matrix for Human Resource Management (HRM)

1	2	3	4	5
Elementary	**Basic**	**Good**	**Well-Performing**	**World-Class**
• Approximate staff number not known • No HR system in place • No clear job descriptions or role profiles that are aligned with strategic intent of the organization • Some evidence that staff compensation is well below local market level • No formal training • No performance evaluations, leading often to an entitlement-based culture vs. a performance-driven one	• Required number of staff not known • HR system in place, but not reliable and focused more on transactional rather than strategic employee data mining, such as tracking vacation/illness • Some evidence that staff compensation is below local market level • Some ad hoc training • Irregular performance evaluations	• Required number of staff approximately known, but not adhered to • Comprehensive and accurate HR system • Compensation for some staff is competitive in local market • Awareness of female participation HR • Formal training programs • Annual performance evaluations	• Staffing close to required number of staff • Comprehensive and accurate HR system • Performance-based compensation • Actively managed staff training and capacity building • Compensation and promotions directly linked to annual performance evaluations • HR strategy that is aligned with organizational strategy • Active gender policy • Gender information and compensation are monitored • HR processes are integrated fully with day-to-day operations • Annual staff surveys • Recognition systems are in place for teams and individuals generating strategically relevant improvements • Succession plan that is tied to and supports a strategic plan	• Optimum staffing level known, presently at optimum level • Comprehensive and accurate HR system • Performance-based compensation that is competitive in local market • Actively managed staff training and capacity building with comprehensive and budgeted education plan that is tied to organizational goals • HR strategy that is aligned with organizational strategy and gender- informed • No gender bias in compensation and awareness • HR processes are integrated fully with day-to-day operations • High employee satisfaction in annual staff surveys • Recognition systems are in place for teams and individuals generating strategically relevant improvements • Succession plan that is tied to and supports a strategic plan

Source: Author's elaboration, including adaptations from IWA-WUEAM; AquaRating; and Kayaga, Mugabi, and Kingdom 2013, 25.

TABLE A.3. Maturity Matrix for Financial Management

1	2	3	4	5
Elementary	**Basic**	**Good**	**Well-Performing**	**World-Class**
• Limited accounting function • Cash-basis accounting • Manual accounting ledgers • No financial budget • No fixed assets register • No liability registers • Quantity-only lists of stores items • Weak internal controls (e.g., single signatories, no segregation of duties, limited cash and bank reconciliations) • Rudimentary income statement, cash balance financial report • Financial report and stores lists audited infrequently by government auditor	• Full accounting function, lead skilled senior accountant • Cash-basis or modified cash-basis accounting (e.g., accounts receivable, fixed assets) • Manual/spreadsheet-based accounting system • Basic financial budget (combining operations and capital by revenue and expense type only) • Limited financial forecasts • Basic fixed asset register, with summary detail by function • Accounting procedures, internal controls, and financial report comply with requirements defined by government • Financial report audited regularly by government auditor • Annual budget/tariff analysis	• Full financial management function, led by experienced financial manager • Accrual-basis accounting • Basic accounting package with supporting spreadsheets, some manual integration • Defined assets, detailed fixed asset register (including cost, location) • Annual financial forecasts • Financial operating and capital budgets (by program, function), updated annually • Basic internal audit function (e.g., focused on revenue and payroll audits) • Accounting principles and financial statements comply with national standards, which generally comply with IFRS • Financial statements compiled and audited by external auditor • Multiyear budget/tariff, analyses, updated annually	• Full financial management function, led by experienced financial manager • Skilled financial analysis staff • Full-function accounting system, limited manual integration • Asset management system, incorporating condition, maintenance planning/management • Cash and debt management capacity • Quarterly financial forecasts/sensitivity analysis, budget review • Full-focus internal audit, reporting to board of directors, annual audit plan • IFRS financial statement prepared internally • Detailed cost of service/tariff study	• Audit committee consisting of independent board members • Finance expert on board of directors • Internal/available debt financing expertise • Fully integrated financial/accounting system • Capital budget based on multiyear capital improvement plan, including life-cycle costing • Established credit rating that enables access to capital markets

Source: Author's elaboration, including adaptations from IWA-WUEAM; AquaRating; and Kayaga, Mugabi, and Kingdom 2013, 25.
Note: IFRS = International Financial Reporting Standards.

TABLE A.4. Maturity Matrix for Technical Operations

Area	1 Elementary	2 Basic	3 Good	4 Well-Performing	5 World-Class
Asset Management	• Lack of clear knowledge of assets and limited record keeping	• Basic record of all infrastructure, not updated	• Updated and comprehensive record of all infrastructure	• Updated and comprehensive record of all infrastructure • Geo-referenced (GIS) data for all infrastructure are available • Risks of critical failures identified	• Strategic asset management plan: existing and implemented • Risks of critical failures identified • Life-cycle costing of assets • A remote-control system exists that relays the operational status of at least 20% of maneuverable devices and equipment positioned in strategic parts of the network
NRW	• No measurement of water into supply and consumption • No strategy for managing NRW	• Minimal measurement of water into supply and consumption • No strategy for managing NRW	• Water balance produced with margin of error of less than 15% • Basic strategy for managing NRW • Some actions taken to reduce commercial or physical losses	• Water balance produced with accuracy of about 10% • Utility unit is responsible for managing real losses • Comprehensive strategy for managing NRW • Monitoring of indicators of physical and commercial losses • Utility unit is responsible for managing real losses • Regular NRW reduction activities • A system to manage pressure in the distribution network is available and implemented	• Water balance produced with accuracy of about 5%, regularly updated • Utility unit is responsible for managing real losses • Effective implementation of a fully comprehensive NRW management strategy • A system to manage pressure in the distribution network is available and implemented
Maintenance	• No maintenance other than breakdown maintenance • Poor records	• Some limited routine maintenance • Basic record keeping	• All essential plants have routine maintenance • Records of maintenance and breakdowns • Up-to-date handbooks exist, and are used, detailing O&M of fixed physical assets	• All essential plants have routine maintenance • Breakdowns and maintenance regularly reviewed to reduce failures and optimize maintenance • Well planned and budgeted O&M planning • Unit within the utility is assigned responsibility for maintaining fixed physical assets	• All essential plants have routine maintenance • Preventive maintenance based on risk assessment • Well planned and budgeted O&M planning • Unit within the utility is assigned responsibility for fixed physical assets

Source: Author's elaboration, including adaptations from IWA-WUEAM; AquaRating; and Kayaga, Mugabi, and Kingdom 2013, 25.

Note: GIS = geographic information system; O&M = operations and maintenance. The descriptors are not only organized by maturity levels, but also by a water utility's typical areas of technical operations—asset management, NRW, and maintenance.

TABLE A.5. Maturity Matrix for Commercial Operations

1	2	3	4	5
Elementary	**Basic**	**Good**	**Well-Performing**	**World-Class**
• Paper customer files, not updated • Manual meter reading and data transfer • < 25% of customers are metered • < 50% of customers are billed • No staff and no strategy for customer communications • No communication to customers prior to supply interruptions • Bills can only be paid at utility premises • No call center	• Computerized customer database, not updated. • Manual meter reading and data transfer • Between 25% and 60% of customers are metered • Between 51% and 75% of customers are billed • Services are billed on a greater than monthly basis • Occasional public awareness campaigns or customer communications • No systematic information for customers prior to supply interruptions • Bills can only be paid at the utility premises • Basic call center	• Computerized customer database, regularly updated and includes user type, service status (active/inactive), meter data, "property data," and other information necessary for billing the service • Manual meter reading and data transfer • Between 61% and 85% of customers are metered • Between 76% and 89% of customers are billed • Billing based on meter reading for more than 60% of billed users • Services are billed at least monthly • Occasional public awareness campaigns or customer communications • Customer outreach gender-informed • Systematic information for customers prior to supply interruptions • Multiple and convenient ways for payment of bills • Call center records calls but cannot provide real-time information • Customer satisfaction surveys are conducted at least on an annual basis	• Computerized customer database, regularly updated and includes user type, service status (active/inactive), meter data, "property data," and other information necessary for billing the service. Internal quality control system • Meter reading with handheld devices, automatic data transfer • Between 86% and 95% of customers are metered • Between 90% and 99% of customers are billed • Billing based on meter reading for more than 85% of billed users • Services are billed at least monthly • Budgeted and staffed customer communications service • Customer outreach is gender-informed and allows female and male participation • Systematic information to customers via a range of media prior to supply interruptions • Multiple and convenient ways for payment of bills • Convenient communication methods to change customer information • Call center records calls and can provide real-time information • Customer satisfaction surveys are conducted at least on an annual basis, with performance targets	• Computerized customer database, regularly updated and includes user type, service status (active/inactive), meter data, "property data", and other information necessary for billing the service; internal quality control system • Automated meter reading • Effective customer relationship management • > 95% of customers are metered • All customers are billed • Billing based on meter reading for all billed users • Services are billed at least monthly • Budgeted and staffed communication service as part of an external relations department • Systematic information to customers via a range of media prior to supply interruptions • Strategy to involve different genders in feedback, payment, and service levels discussion • Multiple and convenient ways for payment of bills • Convenient communication methods to change customer information • Call center records calls and can provide real-time information • Customer satisfaction surveys are conducted continuously with an annual report, with performance targets

Source: Author's elaboration, including adaptations from IWA-WUEAM and AquaRating.

Note: HR = human resources; NRW = nonrevenue water; O&M = operations and maintenance.

APPENDIX B
Action Matrices

This appendix presents typical, high-priority actions that can be taken for each element of the success pyramid according to the utility's level of maturity. Moreover, for each action, a cost estimate, estimated implementation duration, and expected impact on the utility's maturity level are given. These actions are merely indicative and may vary widely depending on the size of the utility, the condition of the utility, actions that have already been taken, and local market conditions. However, they provide a good menu of options for moving a utility to the next maturity level for any element of the success pyramid.

This appendix includes the tables of maturity level 1-4 for the five elements of the success pyramid:

Tables B.1–B.4: Actions for Improving Organization and Strategy
Tables B.5–B.8: Actions for Improving Human Resource Management
Tables B.9–B.12: Actions for Improving Financial Management
Tables B.13–B.16: Actions for Improving Technical Operations
Tables B.17–B.20: Actions for Improving Commercial Operations.

TABLE B.1. Typical Actions for Improving Organization and Strategy of Level 1 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Develop shared mission and vision with a highly participatory approach within the utility	$250,000–$1 million	High	6 to 12 months
• Establish basic rules of corporate governance	< $250,000	High	6 to 12 months
• Develop one-year business plans	$250,000–$1 million	High	3 to 6 months
• Prepare strategy for some high- leverage, priority activities	< $250,000	High	< 3 months
• Develop procedures and systems for monthly reporting	< $250,000	Medium	3 to 6 months
• Define basic organizational structure	< $250,000	Medium	3 to 6 months
• Design and implement basic technology and systems	$250,000–$1 million	High	6 to 12 months
Develop and put in place basic processes and procedures	< $250,000	High	6 to 12 months

Note: Level 1 maturity corresponds to (a utility with) elementary maturity.

TABLE B.2. Typical Actions for Improving Organization and Strategy of Level 2 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Prepare indicative multiyear business plan	$250,000–$1 million	Medium	6 to 12 months
• Develop a plan to improve the utility's corporate governance rules	< $250,000	High	6 to 12 months
• Develop procedures and systems for annual reporting on the utility's management and its performance on key aspects	$250,000–$1 million	Medium	3 to 6 months
• Develop procedures for updating organizational structure to match utility's changing needs	< $250,000	Medium	6 to 12 months
• Design and implement integrated IT systems and operational systems and tools	$1–5 million	High	> 2 years
• Define and put in place all key utility processes	$250,000–$1 million	High	1 to 2 years

Note: Level 2 maturity corresponds to (a utility with) basic maturity.

TABLE B.3. Typical Actions for Improving Organization and Strategy of Level 3 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Develop multiyear strategy for the utility with strategic objectives and underlying specific objectives	$250,000–$1 million	High	6 to 12 months
• Prepare capital budget based on multiyear capital improvement plan linked to multiyear strategy	$250,000–$1 million	Medium	6 to 12 months
• Develop procedures and systems for quarterly reporting on the utility's management and its performance on key aspects	$250,000–$1 million	Medium	3 to 6 months
• Develop measures, mechanisms, and criteria for assessing multiyear strategy, aimed at assessing its success	$250,000–$1 million	Medium	6 to 12 months
• Develop procedures for optimizing organization structure	< $250,000	Medium	6 to 12 months
• Develop approach for integrating strategy development with process planning	< $250,000	High	3 to 6 months

Note: Level 3 maturity corresponds to (a utility with) good maturity.

TABLE B.4. Typical Actions for Improving Organization and Strategy of Level 4 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Develop a strategic plan for achieving SDGs for WSS	$250,000–$1 million	Medium	6 to 12 months
• Develop procedure for continuously and systematically improving organization structure	< $250,000	Medium	3 to 6 months
• Identify and deploy new technologies	$1 million–$5 million	Medium	1 to 2 years
• Develop approach for continuously and systematically improving processes	< $250,000	Medium	6 to 12 months

Note: Level 4 maturity corresponds to a well-performing utility.

TABLE B.5. Typical Actions for Improving Human Resource Management of Level 1 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Carry out inventory of all staff	< $250,000	Medium	< 3 months
• Develop clear job descriptions or role profiles that are aligned with strategic intent of the organization	$250,000–$1 million	Medium	6 to 12 months
• Put in place an HR system that can be easily and reliably updated with the basic information for all staff	$250,000–$1 million	High	6 to 12 months
• Establish proactive strategy for engaging with labor unions	<$250,000	High	3 to 6 months
Identify performance-based incentives that can be provided to employees and develop policy for providing those incentives	< $250,000	High	3 to 6 months

Note: Level 1 maturity corresponds to (a utility with) elementary maturity.

TABLE B.6. Typical Actions for Improving Human Resource Management of Level 2 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Carry out survey of local compensation in the market and compare with compensation of employees	< $250,000	Low	< 3 months
• Develop a documented code of conduct for the utility's employees	< $250,000	Medium	3 to 6 months
• Develop formal training program that can be used for all employees	< $250,000	High	6 to 12 months
• Establish transparent recruitment policy with clear rules and processes for advertising positions, reviewing applications, and selecting staff	< $250,000	Medium	3 to 6 months
• Develop a process for basic annual performance evaluation of all employees	< $250,000	High	3 to 6 months
• Determine staffing (using workforce analysis) required to achieve strategic intent of the organization	< $250,000–$1 million	High	6 to 12 months
• Upgrade HR system with strategic employee data, including links to the organization's strategic intent	$1–$5 million	Medium	1 to 2 years
• Put in place system for management to regularly communicate with all utility staff	< $250,000–$1 million	High	6 to 12 months
• Put in place recognition systems for teams and individuals generating strategically relevant improvements	< $250,000	Medium	< 3 months

Note: Level 2 maturity corresponds to (a utility with) basic maturity.

TABLE B.7. Typical Actions for Improving Human Resource Management of Level 3 Maturity

Action	Estimated Cost	Relative Impact	Estimated Duration
• Recruit employees needed to fill missing positions in the utility's staffing plan	< $250,000	High	6 to 12 months
• Adjust compensation policy as possible to be more competitive in local market and be performance-based	< $250,000	High	3 to 6 months
• Develop and implement plan for actively managed staff training and capacity building	$250,000–$1 million	High	6 to 12 months
• Develop and begin implementing staff satisfaction survey to be carried out on an annual basis	< $250,000	High	6 to 12 months
• Develop policy for directly linking compensation and promotions to annual performance evaluations	< $250,000	High	6 to 12 months
• Integrate HR processes fully with day-to-day operations	$250,000–$1 million	Medium	6 to 12 months
• Develop succession plan tied to strategic and capacity building plan	< $250,000	High	6 to 12 months

Note: Level 3 maturity corresponds to (a utility with) good maturity.

TABLE B.8. Typical Actions for Improving Human Resource Management of Level 4 Maturity

Action	Estimated cost	Relative impact	Estimated duration
Develop comprehensive and budgeted education plan that is tied to organizational goals	$250,000–$1 million	Medium	6 to 12 months

Note: Level 4 maturity corresponds to a well-performing entity.

TABLE B.9. Typical Actions for Improving Financial Management of Level 1 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Appoint director with financial management experience	< $250,000	High	3 to 6 months
• Hire skilled accountant and skilled staff	< $250,000	High	6 to 12 months
• Set up basic accounting system, including accounts receivable and summary-level fixed asset registers, incorporating accounting policies, internal controls and reporting that complies with government-defined requirements	< $250,000–$1 million	High	1 to 2 Years
• Develop financial forecasting capacity	< $250,000	Medium	6 to 12 months
• Set up process for budget preparation, review, and approval	< $250,000	High	6 to 12 months
• Put in place a procurement process that is transparent, ensures a level playing field for all participants, and leads to the award of contracts that represent the best value-for-money given the utility's requirements	< $250,000–$1 million	High	1 to 2 Years

Note: Level 1 maturity corresponds to (a utility with) elementary maturity.

TABLE B.10. Typical Actions for Improving Financial Management of Level 2 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Hire experienced financial manager to lead finance and accounting functions	< $250,000	High	6 to 12 months
• Implement accrual-based accounting and reporting which complies with national standards	$250,000–$1 million	Medium	1 to 2 years
• Define assets, expand fixed asset register to include cost and location of assets	$250,000–$1 million	Medium	1 to 2 years
• Strengthen financial planning capacity	$250,000–$1 million	Medium	6 to 12 months
• Develop capacity for capital improvement planning	$250,000–$1 million	High	6 to 12 months
• Revise budget process to include capital budget and train staff and management on the processes	$250,000–$1 million	High	6 to 12 months
• Create basic internal audit function, and set up revenue and payroll audit processes	< $250,000	High	6 to 12 months
• Engage qualified external auditor	< $250,000	Medium	3 to 6 months

Note: Level 2 maturity corresponds to (a utility with) basic maturity.

TABLE B.11. Typical Actions for Improving Financial Management of Level 3 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Strengthen management processes and capacity to review multiyear forecast and plans	< $250,000	High	6 to 12 months
• Strengthen capacity for financial analysis and planning	< $250,000	Medium	6 to 12 months
• Install full-function, integrated accounting system	$250,000–$1 million	High	1 to 2 years
• Install asset management system incorporating condition, maintenance planning/management	$250,000–$1 million	High	1 to 2 years
• Develop cash management and debt management capacity	< $250,000	High	6 to 12 months
• Set up processes to prepare multiyear capital improvement plan	< $250,000	High	6 to 12 months
• Strengthen internal audit, and shift reporting to board of directors	< $250,000	High	3 to 6 months
• Strengthen processes to prepare IFRS compliant financial statements	$250,000–$1 million	High	6 to 12 months

Note: Level 3 maturity corresponds to (a utility with) good maturity.

TABLE B.12. Typical Actions for Improving Financial Management of Level 4 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Form audit committee consisting of independent board members with finance/audit experience	< $250,000	High	3 to 6 months
• Appoint independent board member with finance expertise	< $250,000	High	6 to 12 months
• Upgrade to fully integrated financial and accounting systems	$1–$5 million	High	> 2 years
• Strengthen capital improvement planning to include life cycle costing	$250,000–$1 million	High	6 to 12 months
• Obtain credit rating to enhance access to commercial financing	$250,000–$ 1 million	High	6 to 12 months

Note: Level 4 maturity corresponds to a well-performing utility.

TABLE B.13. Typical Actions for Improving Technical Operations of Level 1 Maturity

Area	Action	Estimated cost	Relative impact	Estimated duration
Asset Management	Develop comprehensive register of all assets	$250,000–$1 million	Medium	6 to 12 months
	Develop policies and procedures for recording all assets	< $250,000	Low	6 to 12 months
NRW	Develop and implement plan to measure water into supply and main areas of consumption	$1–$5 million	High	6 to 12 months
	Provide training to utility staff on essential tasks for managing NRW	< $250,000	Medium	6 to 12 months
Maintenance	Identify fixed physical assets requiring critical maintenance	$250,000–$1 million	High	6 to 12 months
	Develop policies and procedures for basic routine maintenance of fixed physical assets	$250,000–$1 million	High	6 to 12 months

Note: Level 1 maturity corresponds to (a utility with) elementary maturity.

TABLE B.14. Typical Actions for Improving Technical Operations of Level 2 Maturity

Area	Action	Estimated cost	Relative impact	Estimated duration
Asset Management	Put in place electronic system for regular updating of comprehensive register of all assets	$250,000–$1 million	Medium	6 to 12 months
NRW	Develop basic strategy for managing NRW	$250,000–$1 million	High	6 to 12 months
	Identify and implement short term actions that can be taken to reduce commercial or physical losses	$250,000–$1 million	Medium	6 to 12 months
	Prepare initial water balance and identify actions needed to increase accuracy of the water balance	$250,000–$1 million	High	6 to 12 months
	Meter all water production facilities	$1–$5 million	Medium	6 to 12 months
Maintenance	Develop policies and system for recording all maintenance and breakdowns of physical fixed assets	$250,000–$1 million	Medium	6 to 12 months
	Prepare handbook detailing operation and maintenance of fixed physical assets	< $250,000	High	6 to 12 months
	Develop plan to ensure all fixed physical assets have routine maintenance	$250,000–$1 million	High	6 to 12 months

Note: Level 2 maturity corresponds to (a utility with) basic maturity.

TABLE B.15. Typical Actions for Improving Technical Operations of Level 3 Maturity

Area	Action	Estimated cost	Relative impact	Estimated duration
Asset Management	GIS referencing of all critical infrastructure	$250,000–$1 million	Medium	6 to 12 months
	Identify risks of critical failures of infrastructure	$250,000–$1 million	Medium	6 to 12 months
NRW	Implement actions to increase accuracy of the water balance	$1–$5 million	Medium	1 to 2 years
	Develop comprehensive multiyear strategy for managing NRW	$250,000–$1 million	High	1 to 2 years
	Establish unit within utility responsible for managing NRW	$250,000–$1 million	High	3 to 6 months
	Develop and implement a system for managing pressure in the distribution network	$1 million–$5 million	High	1 to 2 years
Maintenance	Establish process and system for regularly reviewing breakdowns of fixed physical assets to reduce failures and optimize maintenance	$250,000–$1 million	Medium	1 to 2 years
	Establish unit responsible for maintenance of fixed physical assets	$250,000 – 1 million	Medium	6 to 12 months

Note: Level 3 maturity corresponds to (a utility with) good maturity.

TABLE B.16. Typical Actions for Improving Technical Operations of Level 4 Maturity

Area	Action	Estimated cost	Relative impact	Estimated duration
Asset Management	Put in place a remote-control system that relays the operational status of at least 20% of maneuverable devices and equipment positioned in strategic parts of the network	$1–$5 million	Medium	1 to 2 years
Maintenance	Create system for preventive maintenance based on risk assessment	$250,000–$1 million	Medium	6 to 12 months

Note: Level 4 maturity corresponds to a well-performing utility.

TABLE B.17. Typical Actions for Improving Commercial Operations of Level 1 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Develop computerized customer database	$250,000–$1 million	High	6 to 12 months
• Meter all large customers and customers in areas with high consumption	$1 million–$5 million	High	6 to 12 months
• Put in place unit and strategy for communications with customers	$250,000–$1 million	High	6 to 12 months
• Put in place basic system for informing customers ahead of time about supply interruptions	< $250,000	Medium	3 to 6 months
• Develop mechanisms so that customers can pay their bills not only at utility premises	$250,000–$1 million	Medium	6 to 12 months
• Establish internal system for redressal of customer complaints	< $250,000	High	3 to 6 months
• Establish unit responsible for communicating with customers	< $250,000	High	3 to 6 months
• Put in place a basic call center	$250,000–1 million	Medium	6 to 12 months

Note: Level 1 maturity corresponds to (a utility with) elementary maturity.

TABLE B.18. Typical Actions for Improving Commercial Operations of Level 2 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Develop/upgrade computerized customer database so that it is regularly updated and includes user type, service status (inactive/active), meter data, "property data," and other data necessary for billing	$1–$5 million	High	1 to 2 years
• Identify customers not being billed and put in place system to bill between 76% and 89% of customers	$250,000–$1 million	High	6 to 12 months
• Put in place systems and processes necessary to ensure that customer billing is based on meter reading for at least 75% of billed users	$1–$5 million	High	6 to 12 months
• Develop and implement strategy to meter 61–85% of customers	$1–$5 million	Medium	1 to 2 years
• Prepare basic public awareness campaigns and material for communications with customers	< $250,000	Medium	3 to 6 months
• Increase number and convenience of mechanisms for bill payment (including online if possible)	$1–$5 million	Medium	1 to 2 years
• Develop/upgrade capability to systematically inform customers prior to supply interruptions	$250,000–1 million	Medium	6 to 12 months
• Develop transparent policies and procedures for redressal of customer complaints	< $250,000	Medium	6 to 12 months
• Develop and conduct annual customer satisfaction surveys	$250,000–$1 million	Medium	3 to 6 months

Note: Level 2 maturity corresponds to (a utility with) basic maturity.

TABLE B.19. Typical Actions for Improving Commercial Operations of Level 3 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Put in place system for meter reading with handheld devices that have automatic data transfer	$1–$5 million	Medium	1 to 2 years
• Develop and implement strategy to ensure that customers are billed at least on a monthly basis	$250,000–$1 million	Medium	6 to 12 months
• Develop and implement strategy to ensure that between 90% and 99% of customers are billed	$1–$5 million	Medium	1 to 2 years
• Put in place systems and processes necessary to ensure that customer billing is based on meter reading for more than 85 percent of billed users	$1–$5 million	Medium	1 to 2 years
• Develop a policy for public participation, including meetings or consultations with customers' representatives at least once a year	< $250,000	Medium	6 to 12 months
• Establish expert committee for redressal of customer complaints	< $250,000	Medium	3 to 6 months
• Establish fully budgeted and staffed customer communication unit	$250,000–$1 million	Medium	6 to 12 months
• Upgrade call center so that it can provide real-time information	$250,000–$1 million	Medium	6 to 12 months
• Review and make adjustments, as necessary, based on customer satisfaction surveys	< $250,000	Low	< 3 months

Note: Level 3 maturity corresponds to (a utility with) good maturity.

TABLE B.20. Typical Actions for Improving Commercial Operations of Level 4 Maturity

Action	Estimated cost	Relative impact	Estimated duration
• Implement systems and processes for Automated Meter Reading	$1–$5 million	High	1 to 2 years
• Implement systems and processes for effective Customer Relationship Management	$1–$5 million	Medium	1 to 2 years
• Ensure more than 95% of customers are metered	$1–$5 million	Medium	1 to 2 years
• Ensure billing is based on meter reading for all billed users	$250,000–$1 million	Medium	6 to 12 months
• Ensure all customers are billed	$250,000–$1 million	Medium	6 to 12 months

Note: Level 4 maturity corresponds to a well-performing utility.

APPENDIX C
Framework Pilots

The water utility turnaround framework was approved by the World Bank in June 2017. After its approval, two utilities were selected to pilot phase 0 and to recommend a 1-year strategy to start improving performance using the framework. The two utilities chosen were the Water Utilities Corporation (WUC) in Botswana and the Can Tho Water Supply and Sewerage Joint Stock Company (Can Tho Wassco) in Vietnam.

The first pilot was carried out at WUC in October 2017 (Castalia 2017) and the second pilot at Can Tho Wassco the subsequent month (Castalia 2018b). For these pilots, Castalia collected current and historical qualitative and quantitative data to assess performance and initial maturity levels in the areas of commercial and technical operations, and the three key management areas. It next analyzed these data and concluded that both utilities would benefit from a turnaround, and that they were both ready to begin in phase 1.2 (Choose First Commitments).

Although both water utilities were placed in the same phase of the turnaround framework, they each face different challenges. WUC's challenges are related to weak performance in several areas of the utility. While it has the processes and systems in place to improve its performance, it needs to leverage and use them effectively to do so. Can Tho Wassco's challenges, on the other hand, are the result of its low overall initial maturity. Nevertheless, its performance is better than expected, given its initial maturity. The disparity between performance and initial maturity is significant because it suggests that the utility's strong performance may not be sustainable in the future. Can Tho Wassco must strengthen its processes and systems to make it more resilient to future risks from poor management or external influence.

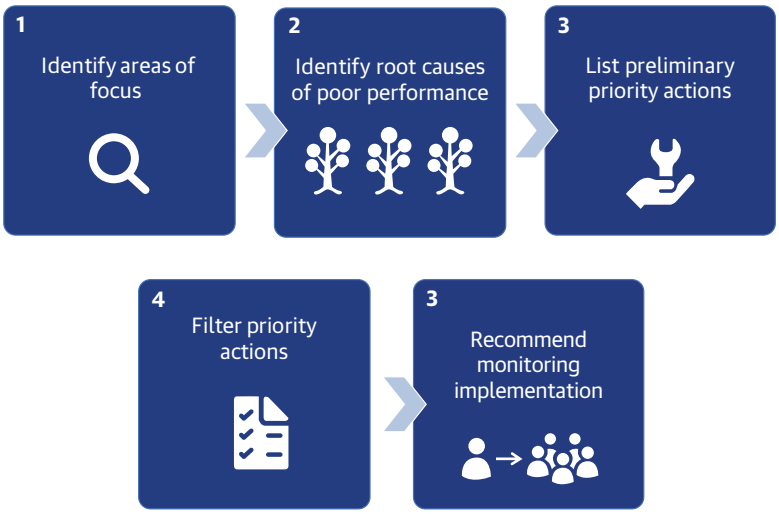
Based on these assessments, a strategy to improve the utilities' performance and initial maturity in 12 months was developed for WUC (Castalia 2018a) and Can Tho Wassco (Castalia 2018b). Both strategies were developed using a 5-step approach that identifies low-cost, high-impact actions for the utility, based on the information gathered for the assessments (figure C.1).

An overview of the strategies developed for WUC and Can Tho Wassco is presented below.

Water Utilities Corporation (WUC)

WUC is a parastatal organization that provides WSS services across Botswana, a country with roughly 2.25 million people.[1] WUC's mandate is relatively new—the utility became the sole water and wastewater service provider in 2009, when the government began to reform the sector. Implementing the reform posed several challenges, especially regarding

FIGURE C.1. The 5-Step Approach to Developing a Strategy for Improving Performance



sustainable finances. WUC went from being a reliable provider of quality service in five urban areas, to a utility with inefficiencies and dilapidated assets. By 2011, WUC was unable to cover its operating expenses and its performance had deteriorated substantially.

Although WUC's performance has improved in recent years, the utility would benefit from a short-term strategy to improve its performance in specific areas and rebuild customer confidence. The outputs from the 5-step analysis conducted to identify low-cost, high-impact actions for WUC are presented below.

Step 1: Identify Areas of Focus

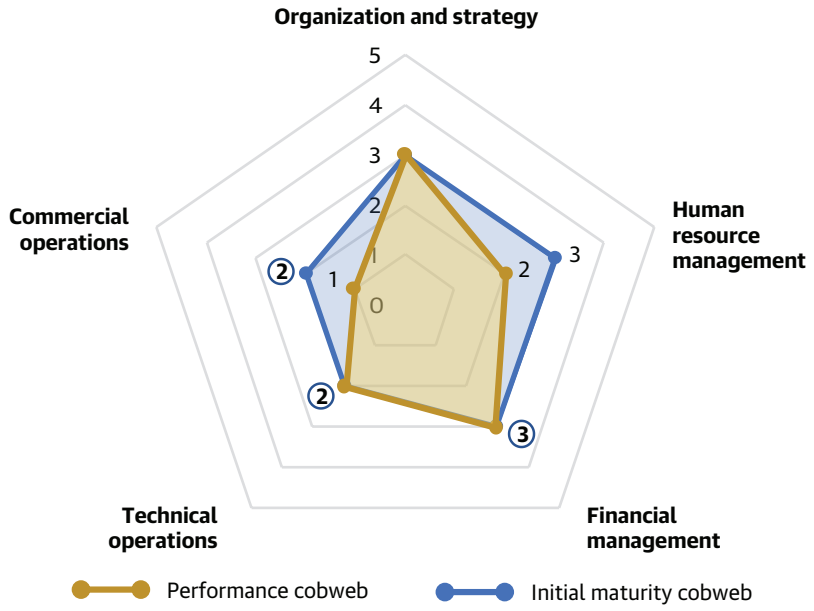
WUC should design a strategy that focuses on improving commercial operations, technical operations, and financial management. These areas were identified by *seeking balance in the cobwebs*, using the utility's performance and initial maturity cobwebs in a two-step process (figure C.2):

1. Comparing the performance and initial maturity cobwebs to identify where there is a **mismatch** between performance and initial maturity level in any relevant area
2. Identifying **asymmetry** within the performance and initial maturity cobwebs, where any point is significantly lower than the rest.

The areas of focus were chosen for the following reasons:

- The **commercial operations** area has a performance level that is lower than its initial maturity level.[2] Performance is low because accounts receivable is high. WUC should concentrate on improving accounts receivable days to boost performance and bridge the gap between performance and initial maturity.
- The **technical operations** area is the one with the lowest levels of performance and initial maturity. It is negatively affected by high nonrevenue water (NRW) in over half of its

FIGURE C.2. Seeking Balance in WUC's Cobwebs



systems. WUC should concentrate on reducing NRW, since this would have the greatest impact on the utility's financial performance and quality of service.

- **Financial management** is poor because WUC's finances have been very volatile since the water sector's reform. WUC needs to improve its financial performance to ensure sustainability in the long run.

Step 2: Identify Root Causes of Poor Performance

The next step in designing WUC's improvement strategy was to identify the root causes of poor performance in these three areas. Logic trees help break down the probable root causes for each problem area and were applied to the three areas of focus.

Commercial operations. Poor performance in this area is driven by high and volatile accounts receivable. The logic tree analysis tested root causes based on the following assumptions:

- **WUC never institutionalized best practices for billing and collections**
  - Three of the five management centers with the largest share of accounts receivable are original WUC service areas, signaling that ineffective billing and collections were in place before the reform (WUC's service area now consists of 16 management centers).
  - Accounts receivable were previously not an issue because WUC relied on revenue from bulk water sales to government customers. The utility did not need to institutionalize effective practices for residential and business customers.
  - Challenges continue to be pervasive across all management centers. Data from meters are not efficiently and effectively used to bill residential customers. Customers are not billed regularly, and WUC does not impose penalties for non-payment.

- **Billing and collection practices that the centers inherited after the reform significantly lag behind**
  - There does not seem to be a significant difference in the centers' ability to collect revenue. The top five centers where accounts receivable is significantly higher than revenue include both old and new centers.

Technical operations. Poor performance in this area can be assessed through NRW. The logic tree analysis tested root causes based on two assumptions:

- **NRW is high in old management centers**
  - Four of the six centers with the highest volume of water lost are old service areas. This indicates that maintenance in old centers is not proactive.
- **NRW is high in new management centers**
  - New centers have a high NRW ratio. Five of the eight centers with an NRW ratio above 34 percent are new and considered *loss producing*. NRW affects the financial sustainability of these centers.

Financial management. Challenges in this area can be analyzed by looking at operating expenses. The logic tree analysis tested root causes based on two assumptions:

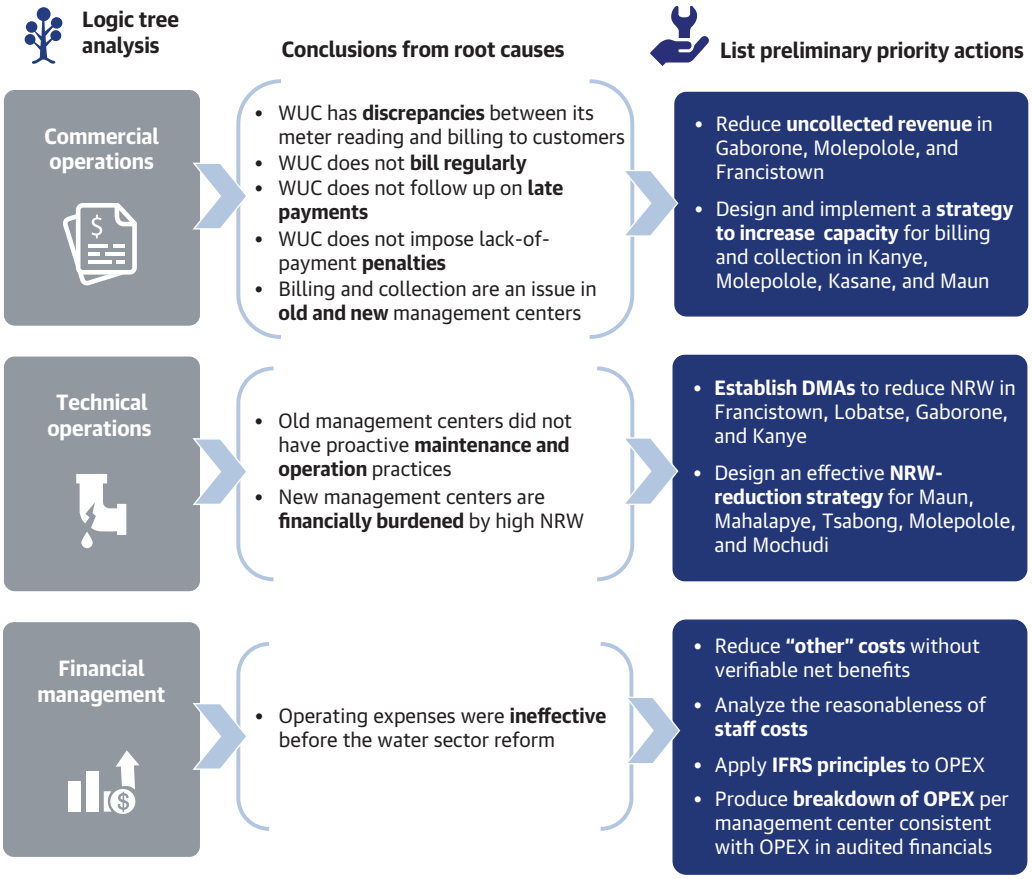
- **OPEX were unreasonable before reform**
  - Staff costs decreased after the reform, even though WUC absorbed over 2,000 employees during the process. Staff costs accounted for 60 percent of total OPEX in 2007, but only 37 percent in 2017. This indicates staff costs were too high due to inefficiencies prior to the reform.
  - "Other" costs have increased substantially since the reform—they rose from 10 percent of total OPEX in 2007 to 39 percent in 2017. More data on these costs are needed for further analysis.
- **Cost of supplies for systems in new management centers were high**
  - Neither chemical nor electricity costs varied much during the reform, signaling that high OPEX are linked more strongly to inefficiencies in staffing and "other" costs. Chemical costs account for 1 percent of total OPEX, while electricity costs account for 8 percent of total OPEX.

Step 3: List Preliminary Priority Actions

The third step in designing WUC's improvement strategy was to define a list of preliminary priority actions for commercial operations, technical operations, and financial management, derived from the logic tree analyses. These actions, and the inputs they are based on, are presented in figure C.3 by area of focus.

All priority actions shown in figure C.3 relatively small but very likely to address the root causes of poor performance in the three areas of focus; meant to last approximately 12 months, that is, a 3-month planning phase followed by a 9-month implementation phase; and meant to be monitored with specific targets and rewards to incentivize employees.

FIGURE C.3. WUC's Preliminary Priority Actions by Area of Focus



Step 4: Filter Priority Actions for Short-Term Gains

A total of 20 actions are recommended for improving performance at WUC in the short term. These actions are the *low-hanging fruits*—actions that can be implemented with relatively little effort and have high potential for improving efficiency in a short time frame. Nevertheless, WUC may find it useful to prioritize some actions over others. This can be done by filtering priority actions according to the guiding principles discussed in section 4.4.2.[3]

The higher an action is ranked, the more likely it is to meet these criteria, but all actions will improve Can Tho Wassco's processes, practices, and systems. Table C.1 lists the top 10 actions by ranking. If WUC has limited resources and time, it should focus on these first.

Step 5: Make Recommendations for Monitoring Implementation

The last step of the improvement strategy requires ensuring that the selected actions are incorporated into the utility's day-to-day operations and properly monitored. The monitoring system in the case of WUC will consist of three structures—the monitoring structure per se, a reporting structure, and an incentive structure:

TABLE C.1. Top 10 Prioritized Actions for WUC

	Action	Rank
1	Design and implement strategy to increase capacity for billing and collections in Kasane	1.06
2	Design and implement strategy to increase capacity for billing and collections in Molepolole	1.07
3	Design and implement strategy to increase capacity for billing and collections in Maun	1.09
4	Design and implement strategy to increase capacity for billing and collections in Kanye	1.10
5	Produce breakdown of OPEX per center consistent with OPEX in audited financials	5.03
6	Reduce uncollected revenue in Molepolole	6.00
7	Design an effective NRW-reduction strategy for Molepolole	6.02
8	Design an effective NRW-reduction strategy for Mahalapye	6.02
9	Design an effective NRW-reduction strategy for Maun	6.03
10	Reduce uncollected revenue in Gaborone	6.05

Note: NRW = nonrevenue water; OPEX = operating expenditures; WUC = Water Utilities Corporation (Botswana).

- **Monitoring structure.** Responsibility over meeting targets will follow the cascading bottom-up approach:
  - Line staff within each management center should be responsible for meeting individual targets;
  - Managers within the management center should be responsible for meeting the targets assigned to that management center;
  - The department heads and executives at WUC headquarters should ultimately be responsible for meeting the targets set for the utility.
- **Reporting structure.** Reporting will mirror the bottom-up approach used in the monitoring structure:
  - Line staff should report to a manager in charge of the department in the management center;
  - The department manager should then report the progress made by the line staff to the general manager at the management center every month;
  - The general manager, who is responsible for overseeing the progress made by the management center, should report to the WUC department head every quarter.
  - This department head oversees the progress made at all management centers and should report to the CEO and other executives on a quarterly basis.
- **Incentive structure.** WUC can use both a profit-share and prize system to incentivize employees:
  - A profit-share system can be used for targets that are related to collecting money owed by customers or lowering costs. Management centers would be given a small percentage of the money they recuperate, and employees within the centers would be compensated based on their performance and overall contribution.
  - A prize system can be used for targetvs that involve designing the most effective and efficient strategy to tackle specific problems (for example, billing and collections, NRW, and OPEX reduction). Winning strategies would be selected by a committee made up of WUC

headquarter managers and an outside stakeholder. The prize would also flow down to the employees who helped create the strategy.

Once WUC has fully implemented its strategy, it may be able to start developing a complete, fully-funded, multiyear action plan. In addition to these specific improvements in commercial and technical operations and financial management, the utility will have increased its reputation with its board of directors, the government, its customers, and its own staff.

Can Tho Water Supply and Sewerage Joint Stock Company

Can Tho Water Supply and Sewerage Joint Stock Company (Can Tho Wassco) provides water services in six districts of Can Tho, a city in the Mekong Delta of Vietnam with 1.26 million people.[4] Can Tho Wassco is a joint-stock company owned by the state (64 percent), private investors (34.6 percent), and utility staff (1.4 percent).

Despite meeting basic performance targets, Can Tho Wassco has a low initial maturity because it performs with weak systems, processes, and procedures. Without adequate, integrated systems and processes, Can Tho Wassco may not have the internal capacity to sustain and improve performance in the medium and long term. The improvement strategy for Can Tho Wassco's therefore proposes high-impact actions that target the areas where initial maturity needs urgent attention. The 5-step analysis conducted against this background and its outputs are presented below.

Step 1: Identify Areas of Focus

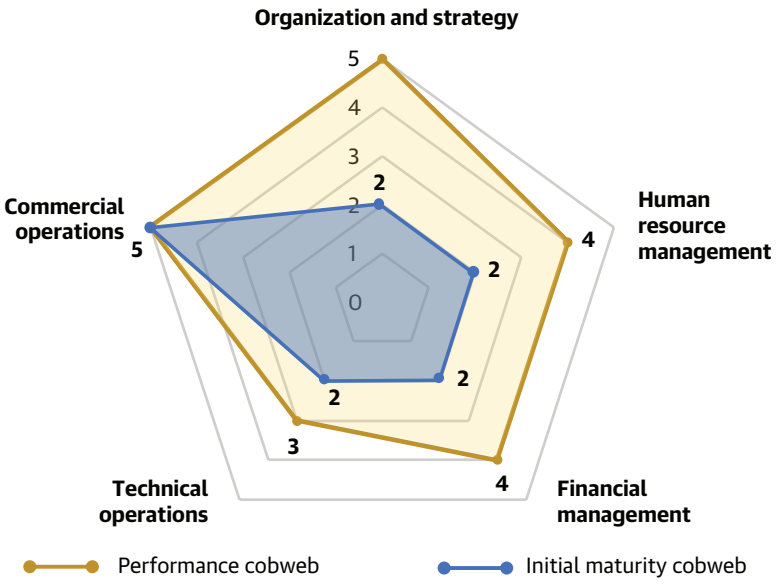
To improve its initial maturity, Can Tho Wassco should focus on actions in four key areas—Organization and Strategy, Human Resource Management (HRM), Financial Management, and Technical Operations. These areas were identified by *seeking balance in the cobwebs*, using the utility's performance and initial maturity cobwebs in a two-step process (figure C.4). These steps include:

1. Comparing the performance and initial maturity cobwebs to identify where there is a **mismatch** between performance and initial maturity in any area within the utility
2. Identifying **asymmetry** within the performance and initial maturity cobwebs, where any point is significantly lower than the rest.

Figure C.4 shows that the initial maturity level is lower than the initial performance level in four areas. The main drivers for this are:

- **Organization and Strategy** is poor because Can Tho Wassco has no strategic intent or outlook. The utility should focus on improving its initial maturity because the processes in this area help determine the utility's strategic intent. They help establish how Can Tho Wassco's short-, medium-, and long-term objectives are set and met.
- **HR Management** is poor because staff are not evaluated and managed based on performance. Can Tho Wassco should concentrate efforts on improving HRM because this area needs systems in place to drive staff productivity and establish incentives based on performance.
- **Financial Management** is poor because management needs to develop processes to budget and plan effectively. These processes include planning to ensure that water services stay

FIGURE C.4. Seeking Balance in Can Tho Wassco's Cobwebs



affordable to customers in the long run and are provided in a manner that is financially sustainable for the utility.

- **Technical Operations** is also the area with the lowest performance in the utility. Performance is low because NRW is high and coverage lies below the desired level. In the immediate future, Can Tho Wassco should develop processes to promote network rehabilitation to minimize physical losses.

Step 2: Identify Root Causes of Initial Maturity

The next step in designing Can Tho Wassco's improvement strategy was to identify the root causes of low initial maturity in these four areas. Logic trees can be used to break down the probable root causes for each problem—identified by asking "why" and arriving at likely reasons, given the assessment of performance and initial maturity levels.

Logic trees were applied to the four areas of focus. As deficiencies in Financial Management were found to be probable root causes for low maturity in Organization and Strategy, the logic trees for these two areas were consolidated into a *single* logic tree for Organization and Strategy. The three relevant logic tree analyses are presented below:

Organization and Strategy. Low initial maturity in this composite area of focus can be analyzed by looking at the utility's lack of a clear strategic intent. The logic tree tested root causes for this based on four assumptions:

- **Can Tho Wassco does not have a shared mission or vision**
  - The utility does not emphasize participatory strategy building. Can Tho Wassco is currently developing a mission and vision statement, but management has failed to involve line staff in the decision-making process.

- The utility's shareholders do not hold management accountable for long-term objectives.

- **Can Tho Wassco lacks incentives and clarity to plan for the long term**
  - The utility's key performance indicators (KPIs) do not measure quality of service or access. Bonuses and rewards are only tied to 1-year results unrelated to service quality and access.
  - The legal framework mandates that utilities submit water development plans that typically involve multiyear actions. Even so, the People's Committee of Can Tho does not require Can Tho Wassco to submit these plans.
  - There is ambiguity over the division between rural and urban areas in the region. If a clear service area is not established, it is not possible for Can Tho Wassco to develop a strategy to meet future demand.
- **Can Tho Wassco has financial barriers to long-term planning**
  - Since its equitization, Can Tho Wassco has not secured multiyear funding, aside from relatively small commercial loans. The utility does not have the necessary cash flows to cover the financing costs of long-term investments.
  - New financial commitments are restricted by a cap of 35 percent of the utility's assets each year. This cap is too low to fund a large investment project.
  - There is a lack of transparency in accounting reporting. There are inconsistencies in the utility's cash flow statements, and its operating expenses and revenues are not discriminated sufficiently.
- **Can Tho Wassco has limited forecasting experience**
  - The utility lacks experience projecting costs beyond the scope of a year. Even so, the utility has experience forecasting water demand, but the lack of clarity over its service demand undermines the accuracy of its forecasts.

HRM. Low initial maturity in this area can be attributed to the utility's failure to manage its human capital based on performance. The logic tree tested root causes for this based on two assumptions:

- **Can Tho Wassco has not developed a staffing plan**
  - The utility does not have clear strategic objectives, which limits its ability to plan and determine its optimal number of staff and their core competencies.
  - Management does not actively dismiss unproductive staff or hire highly competent applicants. Instead, it prioritizes relatives of current employees who meet job requirements.
- **Staff compensation is not directly linked to performance**
  - The differences between salary grades is not enough to incentivize performance. Salaries are indexed to performance, but performance measurements are either vague or discretionary.
  - Can Tho Wassco does not have a clear bonus policy that is tied to performance.

Technical Operations. Low initial maturity in this area can be attributed to the lack of an NRW-reduction strategy, which limits the practices in place to systematically identify and control water losses. The logic trees tested root causes for high NRW based on two assumptions:

- **Can Tho Wassco lacks a water balance by IWA standards**
  - The utility does not have the data necessary to build a complete water balance. In fact, Can Tho Wassco did not recognize a IWA water balance.
- **Can Tho Wassco's active leakage control may be limited**
  - The number of portable pressure and flow meters is limited—Can Tho Wassco cannot measure pressure in several points of its network at the same time, nor can it detect leaks in secondary and distribution pipes.
  - Can Tho Wassco does not have a formal plan to actively prevent and monitor leakage control.
- **Can Tho Wassco lacks comprehensive network management**
  - The utility only rehabilitates the network on an ad hoc basis when an incident occurs. Moreover, Can Tho Wassco does not have an asset management system so it lacks information about the state of its network.

Step 3: List Preliminary Priority Actions

The third step in designing Can Tho Wassco's improvement strategy was to define a list of preliminary priority actions, both internally and externally oriented. Priority actions for Organization and Strategy (and Financial Management), HRM, and Technical Operations can be derived from the logic tree analyses. The nine priority actions, and the inputs they are based on, are presented in figure C.5 by area of focus. Although all proposed actions can be implemented with relatively little effort and have high potential for increasing initial maturity in a short time frame, Can Tho Wassco may find it useful to prioritize some actions over others.

All internal actions shown in figure C.5 are relatively inexpensive and likely to have a high impact on the root causes of poor performance in the areas of focus; are meant to last approximately 12 months, that is, 3-month planning phase and a 9-month implementation phase; and are meant to be monitored with specific targets and rewards to incentivize staff.

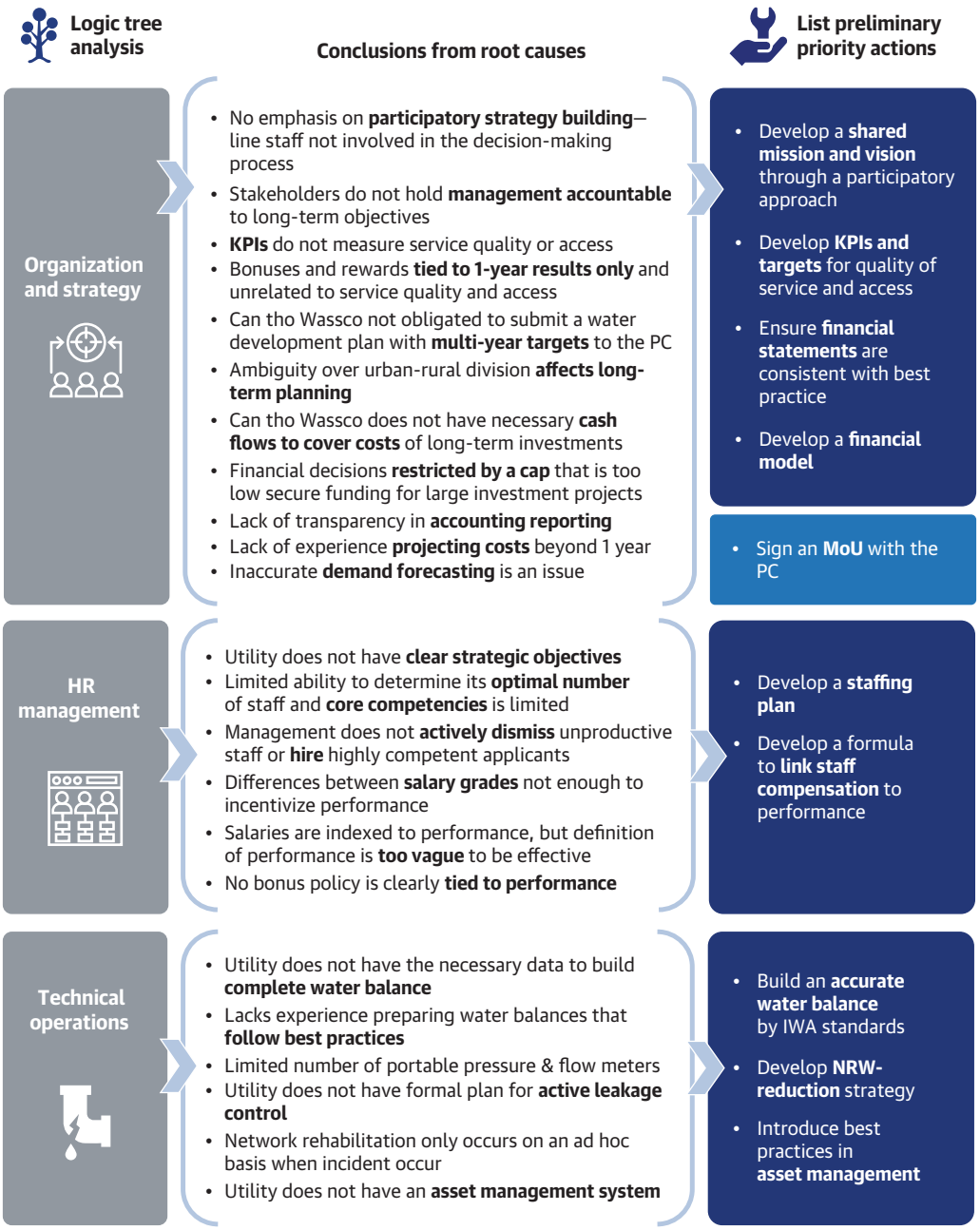
Step 4: Filter Priority Actions

The nine priority actions should be filtered according to the guiding principles discussed in section 4.4.2, and then ranked based on the score assigned to each action.[5] The actions ranked highest are more likely to meet the criteria, but all actions will improve Can Tho Wassco's processes, practices, and systems. Table C.2 lists these actions by ranking. If Can Tho Wassco has limited resources and time, it can initially focus on a few actions at the top of the list.

Step 5: Make Recommendations for Monitoring Implementation

The last step of the improvement strategy requires ensuring that Can Tho Wassco's internal actions are reflected in the utility's daily operations and properly monitored. Can Tho Wassco should develop a monitoring system consisting of three structures—the monitoring structure per se, a reporting structure, and an incentive structure:

FIGURE C.5. Can Tho Wassco's Priority Actions by Area of Focus



Note: IWA = International Water Association; KPI = key priority indicator; MoU = memorandum of understanding; NRW = nonrevenue water; PC = People's Committee of Can Tho. Priority actions listed in dark blue are internally oriented actions. Priority actions in light blue are externally oriented actions to be carried out with the People's Committee of Can Tho.

TABLE C.2. Prioritized Internal Actions for Can Tho Wassco

Action	Rank
Action 1: Define Can Tho Wassco's mission and vision through a participatory approach	1
Action 2: Develop KPIs and targets for quality of service and access	2
Action 6: Develop an NRW-reduction strategy	3
Action 9: Develop a formula to link staff compensation to performance	4
Action 3: Develop a financial model	5
Action 5: Build an accurate water balance by IWA standards	6
Action 4: Ensure financial statements are consistent with best practice	7
Action 7: Introduce best practices in asset management	8
Action 8: Develop a staffing plan	9

Note: KPI = key performance indicator; IWA = International Water Association; NRW = nonrevenue water.

- **Monitoring structure.** Responsibility over meeting targets will follow the cascading bottom-up approach:
  - Line staff within each department should be responsible for individual targets, when applicable
  - Department heads and middle managers should be responsible for meeting the targets assigned to their corresponding department
  - The General Director and the Vice General Directors should ultimately be responsible for meeting the targets set for the utility
  - In some cases, actions meant to boost a utility's internal maturity have targets that are only applicable at the department or utility level. These actions are collective—they involve the participation of departments as units to successfully implement strategies or processes and do not have individual targets.
- **Reporting structure.** Reporting will mirror the bottom-up approach used in the monitoring structure:
  - Line staff in the bottom tier should report to a manager in middle management or in charge of the department (whichever is applicable), as required
  - If necessary, middle management should report on the progress of line staff to the department head as required
  - The department head, who is responsible for overseeing the progress made by the entire department, should report to the General Director and Vice General Directors every quarter
  - If the target in linked to a collective action, the first tier of the reporting structure from line to staff to middle management is not applicable.
- **Incentive structure.** Can Tho Wassco will use a prize system to incentivize employees:
  - A prize system involves awarding a determined prize amount for contributing to solving a specific problem or reaching a milestone associated with the target

- Awards do not necessarily have to be tied to monetary compensation, they can also include more vacation days or paid time off.

Once Can Tho Wassco has completed the implementation strategy, it should start developing a comprehensive,fully-funded, multiyear action plan. In addition to targeted improvements in each focus area, Can Tho Wassco will have strengthened the working relationship with the People's Committee of Can Tho (PC). Thus, the utility will probably be able to proceed to phase 2 of the framework.

Notes

1. Figure taken from the World Development Indicators website: http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators.
2. While HRM also has a mismatch in its cobwebs, it is not considered an area of focus because WUC is undergoing an organizational restructuring and no data were available for the assessment.
3. The 20 actions were filtered using these criteria to produce a prioritized list of actions. Each action was given a score per criterion from a scale of 1 to 5. The actions were then ranked based on their respective total scores. The complete ranking for the 20 actions may be found in Castalia 2018a.
4. These data were taken from the General Statistics Office of Vietnam, "Statistical Yearbook of Vietnam 2016," available at the following website, http://www.gso.gov.vn/default.aspx?tabid=512&idmid=5&ItemID=14277. Last accessed November 29, 2017.
5. The nine actions were filtered using these criteria to produce a prioritized list of actions. Each action was given a score per criterion on a scale of 1 to 5. The actions were then ranked based on their respective total scores. Actions with the same ranking score are prioritized according to their position on a strategy map. A strategy map shows the cause-and-effect links by which specific improvements create desired outcomes. More details may be found in Castalia 2018b.

APPENDIX D
Turnaround Case Studies

This appendix summarizes the case studies of the following studies: Companhia Espírito Santense de Saneamento (CESAN); Da Nang Water Supply Company (DAWACO); Office National de l'Eau et de l'Assainissement (ONEA); Servicio de Agua Potable y Alcantarillado de Arequipa (SEDAPAR); and Société Nationale des Eaux du Bénin (SONEB).

Companhia Espírito Santense de Saneamento (CESAN)

CESAN, the water and sanitation utility in Espírito Santo, Brazil, successfully turned around its performance and continues delivering quality service. CESAN's turnaround path began when a government champion came to power, and a talented manager started running the company. CESAN was under financial distress and faced the threat of privatization. The new manager quickly proved to have entrepreneurial management skills and public sector savvy to reform CESAN. The utility quickly improved its operating cost coverage, collection efficiency, and NRW levels.

In the 1990s, almost two thirds of CESAN's customers suffered supply cuts, and demand was repressed (World Bank 2004). CESAN was captive to political interests[1] and the company engaged in poor operating practices. To secure a loan from the Brazilian Development Bank, the state government agreed to privatize CESAN. Nevertheless, the state government encouraged mismanagement in an attempt to increase the company's potential upside for prospective investors. Excessive spending was coupled with inefficient capital investments, and donor-financed projects were managed inadequately.

When Paulo Hartung was elected Governor of Espírito Santo in 2002, he focused on reverting a decade-long trend of mismanagement by improving transparency, ethics, and financial stability. As part of his reforms, the governor focused on improving CESAN's situation. He appointed Paulo Ruy as CESAN's President in 2003 and backed Ruy's turnaround strategy throughout his term.

Under the helm of Ruy, CESAN embarked on an ambitious path to become a competitive, financially sound, autonomous, and integrated utility with adequate management controls. Mr. Ruy first focused on stabilizing CESAN's finances—or "cleaning house." He cut costs, raised revenues, and imposed a general austerity policy. CESAN also weeded out and canceled contracts that had been awarded for political reasons. The company focused on increasing water and wastewater connections. Within 9 months of beginning the turnaround, CESAN was generating profits.

Once the company's finances had been stabilized, four tracks were instrumental in turning the company around. First, a culture of defining strategic plans was developed and successfully institutionalized. Second, competent staff were hired, and compensation was tied to performance to achieve the objectives of the strategic plan. Third, IT became a core component of CESAN's corporate culture. Management, administrative, and commercial systems were also put in place to improve efficiency and control. Lastly, economically sound capital investments were made.

Today, CESAN is well known in Brazil as a top-performing company with capable human resources, innovative and quality processes, and exemplary corporate governance.[2]

Da Nang Water Supply Company (DAWACO)

Da Nang Water Supply Company (DAWACO), the water utility in Da Nang, Vietnam, successfully turned around between 2007 and 2012, and has maintained strong performance since then. DAWACO's turnaround was driven by improvements in water coverage, nonrevenue water, and staff per 1,000 connections.

Prior to its turnaround, DAWACO struggled with service provision and NRW. As a SOE, DAWACO received financial support from the government, which inadvertently promoted inefficiency and distorted incentives in the utility. Between 2005 and 2007, several conditions came together to trigger DAWACO's turnaround—a shift in government policy, subsequent changes in Vietnam's legal and regulatory framework, and donor support to establish a utility support partnership (USP).

In 2005, the Vietnamese Communist Party decided to reform the legal framework for SOEs to increase their efficiency. The reforms required that SOEs, including state-owned utilities such as DAWACO, transition to a market orientation by 2010. The Vietnamese government also took measures to commercialize the water sector in 2007. The new policies eliminated operating subsidies for SOEs, which effectively removed DAWACO's financial safety net.

In 2007, with the support of the local government's vice chairman, DAWACO developed a USP proposal with Vitens-Evides International (VEI). This partnership gave the utility the assistance it needed to improve performance. Ultimately, these changes in regulation, along with VEI's technical expertise and operational assistance, helped DAWACO set out on a turnaround path.

The USP helped DAWACO properly plan and structure its turnaround. VEI, DAWACO's private partner, provided technical and operational training and expertise to help the utility improve its performance. This allowed DAWACO to use a multidimensional human resource approach that emphasized employee training. VEI also worked with DAWACO staff to implement proper MISs, build capacity, and promote local ownership of the turnaround process. These steps allowed DAWACO to increase managerial efficiency, extend and improve water services, and increase service delivery to the urban poor.

DAWACO has sustained its turnaround since the USP ended in December 2010. The utility has transformed itself from an ineffective, SOE into an efficient joint-stock company in recent years.

Office National de l'Eau et de l'Assainissement (ONEA)

ONEA (Office National de l'Eau et de l'Assainissement), the national water utility in Burkina Faso, achieved a successful turnaround between 1996 and 2007. During this period, the utility implemented changes that improved its service provision, especially regarding water coverage and continuity. ONEA also improved its operating cost coverage and staff per 1,000 connections.

Before 1996, ONEA underwent waves of privatization, socialist policies, and a separation of WSS services. The constant reorganizing, political interference, and inadequate water supply capacity undermined the utility's performance.

Despite serious attempts at improving performance, and significant assistance from donors, by 1995 ONEA had not made much progress. In 1995, the involvement of Salif Diallo, the new Minister of the Environment, and introduction of a new manager, Mamadou Lamine Kouate, changed ONEA's outlook and set it on a turnaround path.

In 1995, ONEA began improving its service provision. Mr. Kouate secured funding for the much needed Ziga Dam, which increased ONEA's low water production capacity. To secure funding, he reformed management to increase credibility with donors and demonstrate ONEA's ability to execute projects. Management engaged in a management contract with Veolia to carry out changes that allowed management to improve commercial operations and increase financial sustainability.

After operating and financial improvements, ONEA took on the challenge of increasing private connections and supplying water to informal settlements in urban centers. It managed to do both. ONEA's sustained success can be explained by management's ability to build on previous gains and internalize knowledge from external experts.

Today, ONEA provides quality water and wastewater services to urban and semi-urban areas throughout Burkina Faso, serving approximately 3.7 million people.[3]

Servicio de Agua Potable y Alcantarillado de Arequipa (SEDAPAR)

SEDAPAR, the WSS utility in Arequipa, Peru, experienced a brief turnaround from 2007-10. Between 1998 and 2007, SEDAPAR's shareholders had interfered with the utility's capacity to recover costs through tariffs. Therefore, the utility could not afford the investments required to meet the regulator's performance targets, not could it cover operating costs.

This vicious cycle came to a halt in 2007, after James Fernández was appointed president of the board of directors and SEDAPAR developed its first new multiannual strategic plan (*Plan Maestro Optimizado*—PMO). The PMO was well received by the regulator's new general manager, who had the management expertise and political know-how required to help SEDAPAR implement its first PMO.

After the 2007-12 PMO was approved, the regulator allowed SEDAPAR to adjust its tariffs before the 2007 targets were met. This tariff adjustment increased SEDAPAR's revenues by 10 percent. With this revenue increase, SEDAPAR was able to make the investments necessary to meet its targets.

Management gained autonomy because SEDAPAR's shareholders no longer made decisions on its tariff adjustment process. The regulator approved tariff adjustments, and management had to use the revenues from tariffs to meet the PMO targets set by the regulator.

SEDAPAR met its PMO targets to the regulator's satisfaction and secured tariff adjustments between 2007 and 2012.[4] To make the capital investments required to increase water production and wastewater treatment capacity, SEDAPAR engaged the private sector for funding.

However, SEDAPAR was unable to sustain its turnaround. Today, the utility's performance is often compromised by crises that are symptomatic of poor management. In August 2014, an algae bloom in the reservoirs significantly decreased water quality.[5] Management was not proactive about controlling the quality of the upstream water resources. In January 2017, a mudslide compromised SEDAPAR's treatment plants, forcing it to stop water production for over 800,000 users for over 3 days.[6] Management was unable to provide water supply alternatives, put in place a contingency plan, and accurately inform customers when service would resume.

Société Nationale des Eaux du Bénin (SONEB)

SONEB, Benin's national water utility, has continuously been improving its performance since its creation in 2003. Despite a difficult start, SONEB is poised to achieve a successful turnaround. It has stabilized its finances by increasing revenue and lowering costs, and expanded service provision to 85 percent of Benin's urban population. SONEB's path to improvement began with the formal separation of water and electricity services in the country. Before 2003, water and electricity services were provided by the *Société Béninoise de l'Eau et de l'Électricité* (SBEE), a single parastatal utility. SBEE was not a well-performing utility—by 2002, the company had accumulated around CFAF100 billion (about $172.1 million)[7] in debt.[8]

In 2002, the government decided to reform SBEE as part of a broader national strategy to reduce poverty, increase welfare, and improve water service delivery. Under the guidance of President Mathieu Kerekou, the government split SBEE into the *Société Béninoise d'Énergie Électrique* (likewise called SBEE) and the *Société Nationale des Eaux du Bénin* (SONEB).[9] SONEB was created under the newly adopted laws of *Organisation pour l'Harmonisation en Afrique du Droit des Affaires* (OHADA), a system of business laws adopted by 17 African countries. SONEB became a SOE with some financial autonomy, with the mission of providing water and wastewater services to the urban areas of Benin.

As a newly formed company that no longer received cross-subsidies from the electricity business in SBEE, SONEB was forced to cover costs and improve performance. Led by Emile Paraiso, the former, highly experienced SBEE director, SONEB worked to improve its poor performance indicators and started making headway almost immediately.

First, SONEB concentrated on improving its workforce by creating a labor agreement; establishing better recruitment policies, emphasizing employee training, and developing performance-based contracts. SONEB thus ensured it had qualified and capable employees from the start.

Next, the utility focused on implementing an actionable and sustainable business plan and financial model. These (4-year) business plans considered the utility's current baseline and

capacity, carefully estimated the costs of achieving performance targets, and defined the resources to cover those costs. These plans were accompanied by growth forecasts for clients, consumption, and revenue, used as the basis for estimating SONEB's future needs. Finally, the utility entered a contract with the government that, among other things, established performance targets that were in line with the objectives outlined in its business plan. SONEB also set up processes to monitor performance against those targets.

Having established a sustainable base for good performance, based on the above actions, SONEB is expected to continue the path of a successful turnaround.

Notes

1. Castalia conversations with CESAN.
2. CESAN holds the 111th position of the top 300 companies in Brazil and is ranked among the top five companies in the WSS sector, according to the magazine Época Negócios 360° ("Cesan entre as 300 Melhores Empresas do Brasil pelo Ranking da Revista Época." August 18, 2016. Accessed December 5, 2016. https://www.cesan.com.br/noticias/cesan-entre-as-300-melhores-empresas-do-brasil-pelo-ranking-da-revista-epoca/.
3. ONEA utility data, 2016.
4. The regulator was satisfied with SEDAPAR's performance between 2007 and 2012. However, SEDAPAR never met all its targets. In fact, its ability to meet PMO targets declined further every year. In 2007, SEDAPAR met 98.40 percent of the PMO targets; in 2011, SEDAPAR only met 65.13 percent of the PMO targets.
5. For details on this algae bloom, see "Arequipa: Sedapar trata y distribuye agua con gusanos y algas según Salud.," available at the website https://larepublica.pe/archivo/830744-arequipa-sedapar-trata-y-distribuye-agua-con-gusanos-y-algas-segun-salud. Last accessed December 9, 2016.
6. More information is available at "Continúa el desabastecimiento de agua potable en la ciudad de Arequipa," available at the following website: https://rpp.pe/peru/arequipa/continua-el-desabastecimiento-de-agua-potable-en-la-ciudad-de-arequipa-noticia-1028025. Last accessed February 3, 2017.
7. The average exchange rate in 2003 for U.S. dollars to West African CFA francs was approximately CFAF581.20 (World Bank 2016).
8. Castalia conversations with SONEB.
9. Ministerial Decree 2003-203 (President of the Republic of Benin, *Creation of the National Water Company of Benin*, Decree 2003-203, June 12, 2003, accessed 23 December 2016, http://www.soneb.com/soneb2/pdf/entreprise/decret-2003-203-reconstitue.pdf).

APPENDIX E
Additional Case Studies

This appendix summarizes relevant case studies conducted earlier. For each case, the synopsis provides the utility's background and a brief description of the actions taken by the utility's management to improve performance and build capacity.

APA Vital (Iaşi, Romania)

APA Vital (Baietti, Kingdom, and van Ginneken 2006) is a water and sewerage company in Iaşi county, in northeastern Romania. APA Vital was established as a joint-stock company in 2007 to reform the regional public water utility, *Regia Autonomă Judeteană Apă Canal Iaşi* (RAJAC Iaşi). Iaşi county is APA Vital's majority shareholder. It owns approximately 99.7 percent of APA Vital's shares, while 90 other local governments own 0.3 percent. The utility's turnaround began after the end of the communist regime in the early 1990s, while it was still RAJAC Iaşi. Years of neglect had left the water sector in terrible shape—service provision was intermittent and unreliable, and water was unsafe to drink.

APA Vital's turnaround was made possible by support from the European Bank for Reconstruction and Development (EBRD). In 1995, Iaşi county received a sovereign loan from the EBRD. The loan allowed the water utility to rehabilitate critical infrastructure, receive technical and managerial hands-on support from international experts, and increase real tariffs. The loan was signed by the Ministry of Finance, which gave the water utility the political clout to implement its tariff increases in an inflationary environment and develop infrastructure rehabilitation programs. The loan also set performance targets for the utility, which were instrumental for its rapid performance improvements in the 1990s. In subsequent years, APA Vital entered into a performance contract with the Intercommunity Development Association, a government association made up of members from different county councils, cities, and communes. Today, APA Vital is an effective water utility that provides water and wastewater services to approximately 426,000 people across 60 communes in Iaşi.[1]

AQUA (Bielsko-Biała, Poland)

AQUA (Baietti, Kingdom, and van Ginneken 2006) is a public limited company that provides water and wastewater services to Bielsko-Biała, a city in southern Poland, and other neighboring municipalities.[2] AQUA was originally established as a stock corporation in 1990 after local government structures were reintroduced in Poland. In 1999, the company was partially privatized but the city of Bielsko-Biała remains AQUA's majority shareholder.

AQUA is considered a successful turnaround case because it enhanced its performance through privatization, properly managed staffing levels, and the adoption of sound external accountability measures. Its private partner, International Water UU Holdings, helped AQUA improve performance. AQUA emphasized training and outsourcing to improve efficiency and reduce staffing levels. AQUA's success also comes from meeting high external accountability measures. Moreover, AQUA must present long-term plans for developing its facilities to the municipality, likewise based on targets. If these targets are not met, the municipality could revoke the company's license for service provision.

eThekwini Water and Sanitation (Durban, South Africa)

eThekwini Water and Sanitation (Heymans et al. 2016) is responsible for providing water and wastewater services to approximately 3.4 million people in eThekwini, a municipality that includes Durban and its surrounding towns in South Africa.[3] eThekwini Water and Sanitation is a unit of the municipal government, which was drastically reformed when apartheid rule ended in South African in 1994. After the end of apartheid, the government had to expand its service coverage beyond affluent white neighborhoods—the government thereby consolidated multiple municipal water departments into eThekwini to streamline its efforts. eThekwini's turnaround began under the leadership of its managing director, who championed institutional and managerial reforms beginning in the early 1990s.

The managing director quickly implemented change to garner political support. His changes embraced technological innovation, customer satisfaction, and a supportive corporate culture. eThekwini's use of technology improved the utility's water provision. eThekwini also created a customer management unit to reorient the utility's focus toward its customers. eThekwini also established community consultation committees to improve community engagement and receive feedback from customers, particularly in poor neighborhoods. Lastly, the managing director instituted managerial policies that successfully changed the corporate culture. Employees were constantly praised as the utility's most important asset and individuals were often recognized for good performance. This approach helped build trust and ownership among the staff. Today, eThekwini is an efficient water utility that covers its O&M costs through its tariffs, despite offering a minimum amount of free water to poor households.[4]

HPWSC (Hai Phong Provincial Water Supply Company – Hai Phong, Vietnam)

HPWSC (Baietti, Kingdom, and van Ginneken 2006) provides water services to Hai Phong, a city in northeastern Vietnam. HPWSC is currently a joint-stock company but was originally structured as an autonomous water board under the city's Transportation and Urban Public Works Department.[5] HPWSC underwent a successful turnaround from 1993 to 1999, while it was still a SOE. The utility's impressive improvements made its later transition to a successful joint-stock company possible.

HPWSC began its turnaround in 1993, after a severe water shortage caused violent riots in the city. The People's Committee of Hai Phong (PC), which oversaw the HPWSC at the time, began reforming the utility due to mounting political and social pressure. The PC focused on

changing management and implementing the *phuong* turnaround model at HPWSC, which focused on achieving improvements in a decentralized manner in every department (*phuong*). First, the PC replaced the management team at HPWSC and appointed a new managing director. Under the direction of the new manager and with the support of the PC, HPWSC raised tariffs and implemented the *phuong* model.

The *phuong* model also emphasized changing the corporate culture to build ownership, improve performance, and enhance customer relations. The HPWSC implemented training sessions and performance-based compensation structures to increase pay scales and motivate employees. The company also institutionalized internal processes and management systems to bolster its performance and customer relations. By 1999, the company was generating profits. NRW was reduced from 70 to 32 percent, and labor productivity improved from 30 employees per 1,000 connections to 7.4 employees per 1,000 connections. Today, HPWSC is considered one of the best-performing water companies in Vietnam.[6]

JNB Water (Johannesburg Water – Johannesburg, South Africa)

JNB Water (Baietti, Kingdom, and van Ginneken 2006) is a government-owned company that provides water and wastewater services to the city of Johannesburg, South Africa. Created in 2001, JNB Water is a limited liability company owned by the Johannesburg city government. The company was the fruit of various sectoral reforms, which separated water management from actual service provision in the government.

JNB Water's success can be attributed to using public-private partnerships (PPPs), outsourcing, and internal performance appraisals to improve performance indicators. For example, JNB Water entered a 5-year, performance-based management contract with the Johannesburg Water Management Company (JOWAM), to improve the utility's capacity. JNB Water also outsourced specialized functions to improve service provision. To motivate its own managerial staff, JNB Water conducts annual internal performance appraisals. Despite its improvements, at the time the case study was carried out, JNB Water faced many challenges, including financial dependence on the government.

NWSC (National Water and Sewerage Corporation – Uganda)

NWSC (Baietti, Kingdom, and van Ginneken 2006; Heymans et al. 2016) is the national utility that provides water and wastewater services to 15 urban centers in Uganda. Established in 1972, NWSC is a statutory body owned by the government. Its management and service provision functions are separated—the board of directors oversees management, and the managing director and staff oversee service provision. NWSC's turnaround began in 1998, with the appointment of a new board of directors. The board of directors in turn appointed a new managing director, who focused on implementing new policies to turn around the poorly performing utility. As the president of Uganda had made water sector reform one of his political priorities, the managing director and the changes he made were fully supported by the government and the president himself.

NWSC's turnaround is deemed successful because it improved service provision by establishing performance targets, increasing accountability measures and incentives, and focusing on

training. Political support was essential for these changes. First, the new managing director implemented performance targets for areas within the utility and increased their autonomy. Areas were responsible for meeting targets and employees were responsible for specific tasks and deliverables. To improve accountability, NWSC used an incentive structure that awarded bonuses to area management for meeting performance targets and penalized them for underperforming. To improve capacity, the company focuses heavily on training. Although NWSC outsources heavily, it uses annual appraisals to prepare a training program for every department, which helps create a sense of ownership in the company. The NWSC now operates under a performance contract with the government, which may penalize the company and remove any director (except the managing director) in the case of underperformance. These changes have created a corporate culture that embraces efficiency and accountability, which ensures NWSC's continued success.

NYEWASCO (Nyeri Water and Sewerage Company – Nyeri, Kenya)

NYEWASCO (Engelsman and Leushuis 2016; Heymans et al. 2016) provides water and wastewater services to Nyeri, a city of approximately 700,000 residents in central Kenya.[7] Although it was originally established in 1995, NYEWASCO was incorporated as a government-owned limited liability company in 1997 to reform the municipal water sector. Water in Nyeri was rationed and unsafe to drink prior to this point, which led the government to establish NYEWASCO with the technical assistance of the German Technical Cooperation Agency (GTZ).

Improvements in water provision began in 1995 under the helm of NYEWASCO's new managing director, who concentrated on implementing modern MISs, emphasizing strategic planning, and building transparency within the water utility. During his tenure, NYEWASCO institutionalized computerized management systems and provided staff with technical and managerial training, thereby significantly raising labor productivity. Strategic planning involved all staff members and became a cornerstone of the utility. Moreover, all processes and systems were audited on a regular basis to ensure a culture of transparency and eliminate corruption. Today, NYEWASCO's repudiation of corruption and political interference—as well as its proper water service provision and commitment to its customers—has helped the utility create a loyal customer base and secured its success.

PPWSA (Phnom Penh Water Supply Authority – Phnom Penh, Cambodia)

PPWSA (Engelsman and Leushuis 2016) is responsible for providing water services to approximately 1.5 million people in Phnom Penh, the capital city of Cambodia.[8] PPWSA was originally created in 1959, but only became an established public corporation in 1996. Prior to 1993, PPWSA was plagued by patronage and corruption. The appointment of a new director at PPWSA in 1993 saw the utility drastically improve its performance and begin its turnaround.

The new director at PPWSA played a pivotal role in the turnaround process. The director cracked down on corruption, pushed for operational efficiency, and used donor support in an effective manner. To lower corruption, the director implemented a system that compelled staff and government officials to lead by example—that is, everyone was forced to install a

water meter and pay for water, even the Prime Minister. To improve operational efficiency, the director focused on increasing water pressure, reducing NRW, and improving collections. The director's effectiveness increased PPWSA's credibility, which resulted in high levels of donor support. The latter allowed PPWSA to receive more technical assistance, adopt new tariff schedules, and rehabilitate and expand its networks. Today, PPWSA is considered Cambodia's best-run utility—it was the first publicly traded company on the Cambodian Stock Exchange and it has consistently recorded an average of approximately $10 million in net profits for the last two years.[9]

PUB (Public Utilities Board – Singapore)

The PUB (Baietti, Kingdom, and van Ginneken 2006) is the national utility that provides water and wastewater services in Singapore, a country with approximately 5.4 million people (World Bank 2016). The PUB was restructured in 2001 as a statutory body under the Ministry of Environment. The PUB is managed by a board of directors, which is comprised of 5 to 10 stakeholders from a wide range of industries that are appointed by the Minister of Environment. Thanks to political support and the overall enabling environment of Singapore, the PUB has always been an effective and efficient utility.

The PUB's success can be attributed to its system of checks and balances, self-regulation, and financial discipline. For example, the PUB follows performance targets and sectoral standards and guidelines strictly. It reports to external accounts like Ministry of Environment and the National Environmental Agency of Singapore, as well as its own board of directors. This ensures a system of proper checks and balances. The PUB's self-regulation comes from building the capacity of its own employees. Staff promotion is based solely on merit, training occurs company-wide, and staff performance is measured annually. Outsourcing is common, which also allows the PUB to streamline its operations. To maintain its financial discipline, the utility also uses a financial manual that dictates procurement and establishes committees to approve specific purchases. The PUB's credibility has allowed it to enjoy a great deal of autonomy and support from the government, making it one of the water companies with the best drinking water and sanitation standards in Asia.[10]

PWD (Philadelphia Water Department – Philadelphia, United States)

The PWD (Baietti, Kingdom, and van Ginneken 2006) provides water and wastewater services to the city of Philadelphia and some municipalities in bordering counties. Established in 1801, the PWD is a ring-fenced department within the city government of Philadelphia. It currently provides water services to 1.7 million people and wastewater services to 2.2 million people.[11] The PWD underwent a successful turnaround in the 1950s, after a period of terrible performance and corruption allegations. The city government developed the Philadelphia Home Rule Charter to lessen political interference in the PWD and grant it financial autonomy.

The Philadelphia Home Rule Charter was essential to improving the performance of the PWD. Although the Charter required that the PWD set its tariffs according to the standards

established by the City Council, the Charter also ring-fenced the finances of the PWD and created an independent Water Fund for the utility. Beginning in the 1970s, the Water Fund allowed the PWD to issue bonds. Proceeds from the bond market provided the PWD with strong incentives to improve transparency and performance. Today, the PWD is an efficient utility that funds 98 percent of its operations primarily through bonds and customer revenue.

SANASA (Sociedade de Abastecimento de Água e Saneamento – Campinas, Brazil)

SANASA (Baietti, Kingdom, and van Ginneken 2006) is responsible for providing water and wastewater services in Campinas, a city of approximately 1.2 million people in southeast Brazil.[12] SANASA is a joint-stock company, in which the Municipality of Campinas owns 99.9 percent of shares. Before 2000, SANASA was a poorly performing utility—it was plagued by financial hardship and corruption, which negatively affected its service provision. With the assistance of a new municipal government, SANASA began implementing reforms that helped turn around the utility in 2000.

SANASA successfully turned around its performance by properly sequencing its actions. First, the municipal government helped SANASA improve its financial performance by adjusting its tariff structure and renegotiating its existing contracts. Next, SANASA carried out a customer survey to analyze future areas of improvement. Finally, SANASA implemented MISs and other technology to reduce NRW. The utility focused heavily on training to properly institutionalize new processes. Today, SANASA is a more efficient utility that enjoys managerial autonomy from the government.

Scottish Water (Scotland, United Kingdom)

Scottish Water (Baietti, Kingdom, and van Ginneken 2006) is the government-owned national utility that provides water and wastewater services to approximately five million people in Scotland. Scottish Water was created in 2002 to merge the three regional water authorities in Scotland.

Scottish Water was created to improve the state of the water sector in Scotland. The government wanted to increase water and sewerage investments in a more effective manner and ensure better service provision to its citizens. Scottish Water has the appropriate elements to sustain a turnaround, including a clear mission, resources to pay qualified staff, and a predictable supply of funds. Nevertheless, at the time this case study was carried out, there was a lack of political support for the utility's autonomy.

SDE (Senegalese Des Eaux – Senegal)

SDE (Heymans et al. 2016) provides water services to approximately 6.5 million people in urban areas of Senegal.[13] SDE was created in 1996 through an *affermage* contract to solve the water shortage crisis in Dakar, the country's capital. The assistance of the Minister of Water and the Water Director in the Ministry, was instrumental to enacting reforms that improved service provision in the country.

SDE's success can be attributed to the success of its *affermage* contract. The government of Senegal had experience structuring PPP contracts, which facilitated familiarity and trust between the participants. The private partner, SAUR, helped improve the capacity of the utility. Moreover, assistance from the World Bank allowed SDE to invest heavily in urgent infrastructure to increase water supply and reduce NRW. SDE managed to increase its operational efficiency by 2013, mainly by maintaining high collection rates, reducing NRW, increasing connections, and raising tariffs.

SIMAPAG (Sistema Municipal de Agua Potable y Alcantarillado de Guanajuato – Guanajuato, Mexico)

SIMAPAG (Baietti, Kingdom, and van Ginneken 2006) provides water and wastewater services to Guanajuato, a municipality in central Mexico with approximately 184,000 people.[14] Established in 1992, SIMAPAG is a statutory body owned by the municipal government of Guanajuato. Nevertheless, SIMAPAG has legal status that separates it from the government, which lets the utility own its assets outright. SIMAPAG began improving its performance in the 1990s, after droughts caused a severe water shortage in the area. The droughts made the government and the public push for reforms, which allowed SIMAPAG to take drastic measures to improve its water service provision.

SIMAPAG introduced various policies to improve its finances and service provision. First, SIMAPAG raised tariffs and indexed its tariffs to ensure they would always exceed the inflation rate. In addition, SIMAPAG developed a disconnection policy for defaulters and adopted a reliable billing and collection system. To justify higher tariffs, SIMAPAG had to improve performance and become more customer-oriented. The utility surveyed customers and implemented a tracking system for complaints. To measure performance internally, SIMAPAG institutionalized balanced scorecards, a tool that uses various indicators and objectives to assess performance. Today, SIMAPAG is considered the utility with the most innovative WSS service processes in Mexico.[15]

SONEDE (Société Nationale d'Exploitation et de Distribution des Eaux – Tunisia)

SONEDE (Baietti, Kingdom, and van Ginneken 2006) provides water services to over 2 million people in Tunisia. It was created in 1968, as a statutory body under the supervision of the Ministry of Agriculture, Environment, and Hydraulic Resources (MAERH).

SONEDE's improvements can be attributed to its *Contrat Plan* with the government, and its two-pronged approach that delegates responsibilities to line managers and outsources greatly to the private sector. However, SONEDE's ability to increase tariffs is greatly limited by the government, so it outsources nonessential operations to increase efficiency. Nevertheless, SONEDE still faces obstacles, including increasing marginal costs, as it expands coverage to rural areas.

Notes

1. APA Vital provides water services to 60 communes and wastewater services to 29 communes (APA Vital, "Profil Companie," at http://www.apavital.ro/profil_companie-1682-ro.html). Last accessed December 30, 2016).

2. As a public limited company, AQUA operates separately from the city of Bielsko-Biała but is formed and majority-owned by the municipality of the city.

3. Data taken from the website http://www.statssa.gov.za/?page_id=1021&id=ethekwini-municipality 2011. Last accessed December 30, 2016.

4. eThekwini offers 9 m^3 of water to poor households for free.

5. For more details, see "HNX: Upcom Admission of Hai Phong Water Joint Stock Company," available at the website http://en.stockbiz.vn/News/2016/11/14/701431/hnx-hnx-upcom-admission-of-hai-phong-water-joint-stock-company.aspx. Last accessed December 30, 2016.

6. For more information on HPWSC, see the article "Hai Phong Water Supply Co., Ltd.: Promoting Cooperation with Japanese Partners," posted on the website (http://vccinews.com/news_detail.asp?news_id=29024). Last accessed December 30, 2016.

7. Data taken from the Kenya National Bureau of Statistics website (https://www.scribd.com/doc/36672705/Kenya-Census-2009). "Kenya: 2009 Population and Housing Census Highlights." Lat accessed December 30, 2016.

8. Data taken from "Facts," available at the Phnom Penh City website: http://phnompenh.gov.kh/en/phnom-penh-city/facts/. Last accessed December 30, 2016.

9. For more details, see "Revenue Rises in Q3 at Capital's Water Firm," available at The Phnom Penh Post website: https://www.phnompenhpost.com/search/node/business%20firms%20put%20out%20q2%20financial%20reports?search_options=search_title. Last accessed December 30, 2016.

10. More details are given at the website *Sustainable Cities Index 2015* (accessed December 30, 2016). https://www.arcadis.com/media/E/F/B/%7BEFB74BBB-D788-42EF-A761-4807D69B6F70%7D9185R_Arcadis_whitepaper_2015.pdf

11. These data were taken from the following website: http://www.phila.gov/water/aboutus/Pages/AboutPhiladelphiaWater.aspx. Last accessed December 30, 2016.

12. These figures were taken from "Estimativas de População para 1° de Julho de 2015," available at the Brazilian Institute of Geography and Statistics website (https://ww2.ibge.gov.br/home/estatistica/populacao/estimativa2015/estimativa_dou.shtm). Last accessed December 29, 2016.

13. More information is available at the SDE website: http://www.sde.sn/Pages/Presentation.aspx. "Vingt ans au Service de l'Hydraulique Urbaine." Last accessed December 30, 2016.

14. National Institute of Statistics and Geography of Mexico. 2015. "Número de Habitantes." Accessed December 30, 2016, http://cuentame.inegi.org.mx/monografias/informacion/Gto/Poblacion/default.aspx?tema=ME&e=11.

15. See article "Recibe SIMAPAG Reconocimiento Nacional por Innovación." Zona Franca. November 20, 2015. Accessed December 30, 2016, http://zonafranca.mx/recibe-simapag-reconocimiento-nacional-por-innovacion/.

APPENDIX F
The Multifaceted Utility Success

Successful water utilities provide sufficient, reliable, convenient, and safe water supply cost-effectively, while serving a large and increasing share of people in the service area, with a special focus on the poor, all in a manner that is transparent, financially sustainable, and responsive to citizens.[1] This definition of success is from the perspective of the citizen, and can be elaborated in 10 dimensions, each of which can be measured with one or more key performance indicators (table F.1).

TABLE F.1. The 10 Customer-Oriented Dimensions of Utility Success

Dimension	Definition	Key performance indicator
Accessibility	Most of the population in the utility's service area obtains water that is safe, sufficient, reliable, and convenient	Share of population (total and poor) with access to various levels of service (percentage)
Safety	The water supplied is safe to drink (that is, potable)	Appropriate quality standards, appropriate sampling and testing, independent verification, public reporting systems are in place and water complies with standards
Sufficiency	People get enough water to meet basic health requirements	Liters/capita/day (lpcd, the WHO benchmark is 50 lpcd in urban areas)
Reliability	Water is continuously available, with few supply interruptions of limited duration	Average number of hours of water availability per day. (The benchmark is continuous availability, that is, 24 hours per day)
Convenience	Service delivery should be on-site. In the case service delivery is off-site, water does not have to be carried far	The benchmark is on-site delivery. For off-site service, round-trip time to collect water should be less than 15 minutes
Cost-effectiveness	The service is provided cost-effectively—that is, resources are used both effectively and efficiently	Composite indicator based on cash collection ratio, nonrevenue water, and staff productivity
Financial Sustainability	Sufficient resources are available to maintain, replace, and expand the infrastructure so that accessibility, safety, sufficiency, reliability, convenience, and cost-effectiveness continue long into the future	Operating cost coverage ratio
Affordability	Poor households can afford water to meet at least their basic needs	Household expenditure on water/ household total expenditure, measured for poor people
Responsiveness	The utility is responsive to customers	A customer call center is established and there is a system in place to track customer complaints
Transparency	Customers and stakeholders have access to reliable and timely information on the utility's activities, finances, and performance	Published annual report with audited financial statements and information on utility performance available on a regularly updated utility website

Source: Adapted from Heymans et al. 2016.

From these 10 dimensions, performance is measured quantitatively with an aggregate success index that uses seven key performance indicators. These indicators can be measured in a standardized way across utilities around the world and provide a snapshot of a utility's level of performance. Table F.2 shows the seven indicators of the success index, and each indicator's scoring method, parameters, and weight.

TABLE F.2. The Success Index

Indicator	Scoring (max 100 in each subcategory)	Weight
Service		**40**
Water coverage (*Accessibility*)	Utility-reported access to water (%) * 100	15
Average consumption (*Sufficiency*)	• If liters/person served/day < 50, score = 0 • If liters/person served/day ≥ 150, score = 100 • Otherwise, score = (liters/person served/day) – 50	10
Water continuity (*Reliability*)	[(Hours of service/day) / 24 hours] * 100	15
Management effectiveness		**60**
Operating cost coverage (*Financial sustainability*)	• If < 1.00, score = 0 • If ≥ 1.20, score = 100 • Otherwise, score = 50 + [(OCC – 1) / 0.2] * 50	18
Collection rate (*Cost effectiveness*)	Collection rate (%) * 100 *If collection ratio* > 100%, score = 100	14
NRW (*Cost effectiveness*)	• If NRW < 20%, score = 100 • If NRW ≥ 60%, score = 0 • Otherwise, score = [(NRW – 20%) / 40%] * 100	14
Staff per 1,000 connections (*Cost effectiveness*)	• If staff/1,000 conn. < 4, score = 100 • If staff/1,000 conn. ≥ 12, score = 0 • Otherwise, score = 100 – [(staff/1,000 connections) – 4]/ 8 * 100	14
TOTAL		**100**

Note: OCC = operating cost coverage; NRW = nonrevenue water.

Note

1. Adapted from the original definition in Heymans et al. (2016) to include the dimension "financially sustainable."

APPENDIX G
The Turnaround Framework and World Bank Processes

As described in chapter 3, the empirical evidence shows that improving public water utilities takes time (in some cases more than 10 years). The turnaround framework recognizes this by proposing a longer-term approach where some phases may be repeated. The full application of the framework may take longer than it typically takes to prepare and implement a project financed by the World Bank. However, the framework can be a practical and effective instrument for the bank to improve its support of the WSS sector—during project preparation and implementation, and in developing the knowledge base on improving public water utilities.

Project Preparation

During project preparation, a task team can use the framework's tools for assessment; to identify actions to be financed; and to communicate key challenges faced by the sector or individual utilities.

The framework's phase 0 tools provide a structured approach from the beginning of the project's appraisal to comprehensively assess key aspects of the utility:

- Its current level of performance in each of the management and operation areas, using the performance table (table 4.2)
- Its current level of maturity in each of the management and operation areas, using the initial maturity matrix (table 4.3). This matrix can help:
  - Identify red flags that may reduce the probability of success and may need to be addressed before loan signing or effectiveness. The analysis can inform the risk assessment and identify mitigating actions
  - Calibrate the type, magnitude, and complexity of the capital investments that would be financed by the World Bank with the utility's current level of maturity
- The probability of it proceeding quickly to a successful turnaround, using the phase 2 checklist. With this information, the TTL can gain a better understanding of the potential speed and scope of any necessary reform within the utility or governing environment
- The key technical, operational, commercial, and financial indicators, using the decision tool (as described in section 4.1.1). The decision tool converts the indicators into U.S. dollars and cubic meters, so they can easily be benchmarked against other utilities.

The phase 0 tools can then be used to produce outputs that identify the utility's key areas for improvement to external stakeholders, particularly government counterparts. The

outputs could also help explain some of the conditions that are impeding the utility's improvement.

In addition, in conjunction with the results of the initial maturity matrix, the utility and the World Bank can use the action matrices developed for this framework to identify:

- High-priority, short-term actions that the utility could take during project preparation
- Actions that could be included in the project to be financed by the World Bank.

Finally, when preparing a sector-wide loan, a World Bank may use the framework's tools to assess the performance and maturity of multiple water utilities in the country simultaneously. The results yielded by these tools could easily be aggregated to identify common challenges faced by the utilities. For example, the assessment might show that human resource capacity in all the utilities was particularly low, or that all utilities needed to substantially improve the information they had about the condition of their fixed assets. With this information, sector-wide interventions for those common challenges can be designed.

Project Implementation

During project implementation, the framework can inform the World Bank and the utility about actions that are needed to improve performance. At every stage of project implementation, the framework offers a structured analysis of performance and maturity of the utility. During project implementation, framework tools can be used for:

- Monitoring and evaluating the performance and development of the utility, using the performance table and maturity matrices. The results of these tools should indicate the annual progress in performance and maturity.
- Identifying specific interventions to improve poorly performing projects. When projects are not performing well, the World Bank and its counterpart may use:
  - The maturity matrices to identify weaknesses within the management and operations of the utility that may be impeding progress on implementation;
  - The action matrices to identify actions that can improve the utility's performance and maturity, and therefore the project's implementation.
- Preparing follow-on lending projects. Toward the end of project implementation (for example, 6-12 months before the end), the World Bank can use:
  - The assessment tools to determine an appropriate path for the utility during follow-on project implementation;
  - The action matrices to identify actions and investments that could be included in a package for additional financing from the World Bank.

Develop the Knowledge Base on Improving Public Water Utilities

From a more general World Bank perspective, the standard use of the turnaround framework would greatly contribute to understanding how to improve public water utilities. If the

framework's tools were used widely and regularly, the World Bank would be able to track the performance and maturity of many utilities across time, thus helping the World Bank identify:

- How specific actions or sets of actions affect the performance and maturity of utilities
- How long it may take utilities to progress from one level of maturity to another (for example, from a 2 (basic) to a 3 (good) level), and what the most effective contributors to their progress are
- The most important elements of a utility's management and operations for improving performance.

Furthermore, with extensive use of the turnaround framework, some of the tools (such as the maturity matrices and action matrices) could be enhanced and tailored, using feedback and results from its application.

GLOSSARY

Term	Definition
Accounts receivable (days)	The average number of days that a customer invoice is outstanding before it is collected. It equals accounts receivable (net of provisions for doubtful accounts) divided by revenues and then multiplied by 365. This indicator allows an organization to evaluate the effectiveness of its credit and collection efforts.
Collection rate	The percentage of the total amount billed that is actually collected. It is calculated as cash collected divided by revenues.
Commercial losses (or apparent losses)	Includes all types of inaccuracies associated with customer metering as well as data handling errors (meter reading and billing), plus unauthorized consumption (theft or illegal use).
Connections	The fixtures, joints, and pipes connecting from the main to the measurement point or the customer curb stop, or where several registered customers share a physical hookup.
Continuity	The period of uninterrupted water distribution to customers divided by the maximum possible period (24 hours per day, 365 or 366 days per year).
Coverage	The population with access to water services (either with direct service connection or within reach of a public water point) as a percentage of the total population under the utility's service responsibility.
Customer	An individual or organization that is an authorized recipient of water services from the utility.
Debt Service Coverage Ratio (DSCR)	A measure of the ability of a business to meet its regular debt obligations. DSCR is the ratio of the annual business cash flow available for debt repayment (net operating income) to its total debt service (including interest, principal, sinking-fund and lease payments that are due in the coming year).
Earnings before interest, tax, depreciation and amortization (EBITDA)	A measure of an organization's operating performance, evaluated without factoring in financing decisions, accounting decisions, or tax environments. EBITDA is calculated by adding back the non-cash expenses of depreciation and amortization to an organization's operating income.

Term	Definition
Economic level of NRW	The level of water losses that results from a policy under which the marginal cost of each individual activity for managing losses can be shown to be equal to the marginal value of water in the supply zone (Pearson, David, and Trow 2005).
Nonrevenue water (NRW)	The difference between the volumes of system input and billed authorized consumption. NRW includes not only the real losses and apparent losses (that is, physical and commercial water losses), but also the unbilled authorized consumption.
Physical losses (or real losses)	Actual water losses from the system and the utility's storage tanks, up to the point of customer use. In metered systems, this is the customer meter. In unmetered situations, this is the first point of use (tap) within the property.
Return on capital (ROC)	A profitability ratio that measures the return that an investment generates for capital contributors, that is, bondholders and stockholders. It indicates how effective an organization is at turning capital into profits.
Tariff	The price or prices a water provider charges its customers for water services.
Utility	A formal provider of water or sanitation services through a network.
Water losses	The difference between system input and authorized consumption. Water losses can refer to total volume for the *whole* system, for *partial* systems (such as transmission or distribution schemes), or for *individual* zones. Water losses consist of physical and commercial losses.
Water balance	A top-down audit of physical (real) losses of the whole system, starting with the total system input. A well-established water balance requires estimates of water volumes to be made at each measurement point applicable to the system being evaluated. Where actual measurements are available, these data should be used. In the absence of meters, a "best estimate" based on other, related available data and sound judgment may be required. A water balance is normally computed over a 12-month period, and thus represents the annual average of all components.
Water services	Services involving the supply of water to people and organizations, the removal of wastewater from their premises, and the drainage of water from areas where it is not wanted.

BIBLIOGRAPHY

Andrews, Matt, Lant Prichett, and Michael Woolcock. 2017. *Building State Capacity.* Oxford, United Kingdom: Oxford University Press.

Baietti, Aldo, Kingdom, William, and Meike van Ginneken. 2006. "Characteristics of Well-Performing Public Water Utilities." *Water Supply and Sanitation Working Note No. 9*. Washington, DC: World Bank. Accessed April 3, 2017. http://documents.worldbank.org/curated/en/110951468155137465/Characteristics-of-well-performing-public-water-utilities

Bender, Kevin. 2017. *Introducing Commercial Finance into the Water Sector in Developing Countries.* World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/26187 License: CC BY 3.0 IGO.

Castalia 2017. *Assessment of the Water Utilities Corporation.* Castalia Internal Report.

———. 2018a. *Turnaround Pilot: Draft Implementation Strategy for the Water Utilities Corporation*. Castalia Internal Report.

———. 2018b. *Turnaround Pilot: Draft Implementation Strategy for the Can Tho Water Supply and Sewerage Joint Stock Company.* Castalia Internal Report.

———. 2018c. *Assessment Report of the Can Tho Water Supply and Sewerage Joint Stock Company.* Castalia Internal Report.

Engelsman, Geert, and Michel Leushuis. 2016. *Review of Success Stories in Urban Water Utility Reform.* Rebel Group. Final Report to the State Secretariat for Economic Affairs—Switzerland.

Heymans, Chris; Eberhard, Rolfe; Ehrhardt, David; and Shannon Riley. 2016. *Providing Water to Poor People in African Cities Effectively: Lessons from Utility Reforms.* World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/25115 License: CC BY 3.0 IGO.

Hutton, Guy, and Mili Varughese. 2016. *The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene.* World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/23681 License: CC BY 3.0 IGO.

IDB (Inter-American Development Bank). 2013. "HA-L1090: Institutional Strengthening and Reform of the Water & Sanitation Sector." Accessed 3 April 2017. http://www.iadb.org/en/projects/project-description-title,1303.html?id=HA-L1090.

Kayaga, Sam, Mugabi, Josses, and William Kingdom. 2013. "Evaluating the Institutional Sustainability of an Urban Water Utility: A Conceptual Framework and Research Directions." *Utilities Policy* 27: 15-27.

Koch, Richard. 2008. "How to Think 80/20" in *The 80/20 Principle: The Secret to Achieving More with Less*. New York: The Doubleday Publishing Group, 21-42.

Kolker, Joel. 2017. "Towards Universal Access to Water and Sanitation by 2030: Charting Finance Strategies." Draft to the World Bank. (March).

Kolker, Joel Evan; Kingdom, Bill; Trémolet, Sophie; Winpenny, James; and Rachel Cardone. 2016. *Financing Options for the 2030 Water Agenda.* Water Global Practice Knowledge Brief. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/25495 License: CC BY 3.0 IGO.

Locussol, Alain, and Meike van Ginneken. 2010. *Template for Assessing the Governance of Public Water Supply and Sanitation Service Providers.* Water Working Notes, Note No. 23. Washington, DC: The World Bank. Accessed 15 May 2017. http://documents.worldbank.org/curated/en/859361468161368270/Template-for-assessing-the-governance-of-public-water-supply-and-sanitation-service-providers

Muller, Mike; Robin Simpson, and Meike van Ginneken. 2008. *Ways to Improve Water Services by Making Utilities More Accountable to Their Users: A Review*. Water Working Notes, Note No. 15. Washington, DC: The World Bank. Accessed April 3, 2017. http://

documents.worldbank.org/curated/en/389131468338350788/Ways-to-improve-water-services-by-making-utilities-more-accountable-to-their-users-a-review.

Mumssen, Yogita; Saltiel, Gustavo; Kingdom, Bill. 2018. *Aligning Institutions and Incentives for Sustainable Water Supply and Sanitation Services*. World Bank, Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/29795 License: CC BY 3.0 IGO.

National Congress of Brazil. 2007. *Law 11.445/2007*. National Sanitation Law. January 5, 2007. Accessed December 5, 2016. http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2007/lei/l11445.htm.

OECD (Organisation for Economic Co-operation and Development)/DAC (Development Assistance Committee) and the World Water Council. 2008. "Donor Profiles on Aid to Water Supply and Sanitation." Accessed April 3, 2017. https://www.oecd.org/dac/stats/41752319.pdf.

Pearson, David, and Stuart Trow. 2005. "Calculating Economic Levels of Leakage." Leakage 2005 Conference Proceedings. Accessed May 15, 2017. http://rash.apanela.com/tf/leakage/Calculating%20Economic%20Levels%20of%20Leakage.pdf.

UNICEF (United Nations Children's Fund) and WHO (World Health Organization). "Diarrhea: Why Children are Still Dying and What Can Be Done." October 2009. Accessed April 3, 2017. http://www.unicef.org/health/index_51412.html.

———. *Progress on Sanitation and Drinking Water - 2015 Update and MDG Assessment*. 2015. Accessed April 3, 2017. http://files.unicef.org/publications/files/Progress_on_Sanitation_and_Drinking_Water_2015_Update_.pdf.

van den Berg, Caroline and Alexander Danilenko. 2017. *Performance of Water Utilities in Africa* Washington, DC: World Bank. Accessed June 22, 2017. https://openknowledge.worldbank.org/handle/10986/26186.

WASHFunders. Funding Map. Accessed April 3, 2017. http://washfunders.org/funding-map/.

Winpenny, James. 2003. "Report of the World Panel on Financing Infrastructure - Financing Water for All." Accessed May 15, 2017. https://www.oecd.org/greengrowth/21556665.pdf.

World Bank. 2004. "Implementation Completion Report (CPL-37670) on a Loan in the Amount of US$154 Million to the State of Espírito Santo, Brazil." Accessed December 5, 2016. http://documents.banquemondiale.org/curated/fr/159401468768856361/pdf/27848.pdf.

———. 2013. "World Bank to Finance New Kenyan Water Infrastructure for More Irrigation, Agriculture, and Jobs." (June). Accessed April 3, 2017. http://www.worldbank.org/en/news/press-release/2013/06/18/world-bank-finance-new-kenyan-water-infrastructure-irrigation-agriculture-jobs.

———. 2014. Water Supply and Sanitation: Sector Results Profile. Accessed April 7, 2017. http://www.worldbank.org/en/results/2013/04/12/water-sanitation-results-profile.

———. 2016a. *Operational Manual: Global Program on Developing Good PBC Practices for Managing NRW*. Public Private Infrastructure Advisory Facility (PPIAF) Internal Report.

———. 2016b. *Using Performance-Based Contracts to Reduce Non-Revenue Water*. Public Private Infrastructure Advisory Facility (PPIAF) Paper.

———. 2017. *Crowding-In Commercial Finance in World Bank Water and Sanitation Operations: A How-To Guide for World Bank Task Teams*. Internal report. Washington, DC: World Bank.


GWSP
GLOBAL WATER
SECURITY & SANITATION
PARTNERSHIP


WORLD BANK GROUP

SKU W18033