



INSTITUTE FOR SUSTAINABLE FUTURES

**A SERVICE DELIVERY APPROACH FOR  
RURAL WATER SUPPLY IN TIMOR-LESTE:  
INSTITUTIONAL OPTIONS AND STRATEGY**



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MARCH 2012

# **A service delivery approach for rural water supply in Timor-Leste: Institutional options and strategy**

Prepared for: BESIK

**AUTHOR**

Dr Juliet Willetts

# TABLE OF CONTENTS

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<b>Executive summary</b>	<b>vii</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Background	1
1.2 Operation and maintenance within a ‘service delivery approach’	2
<b>2 Current strengths and challenges in the rural water supply sector</b>	<b>3</b>
2.1 Strengths	3
2.2 Challenges	3
2.3 Current levels of functionality	4
2.4 Key determinants of functionality	6
2.5 Cycles of management and maintenance	8
<b>3 Improving the current community management model</b>	<b>9</b>
3.1 Description of current model	9
3.2 Strengths of current model	10
3.3 Potential improvements to current model	11
<b>4 Building blocks towards a service delivery approach</b>	<b>14</b>
4.1 Professionalise community management	14
4.2 Promote alternative service provider models	16
4.3 Support availability of parts and specialised technical assistance	20
4.4 Set sustainability targets and indicators	22
4.5 Standardise norms and procedures	23
4.6 Provide direct support to service providers	23
4.7 Provide capacity building to service authorities	24
4.8 Plan for asset management	25
4.9 Undertake planning and budgeting based on life-cycle costs	25
4.10 Regulate rural services	28
4.11 Promote learning and sharing	28
<b>5 Taking action</b>	<b>29</b>
5.1 Government of Timor-Leste	29



<b>5.2 Donors</b>	<b>31</b>
<b>5.3 International and local NGOs</b>	<b>32</b>
<b>5.4 Private sector</b>	<b>32</b>
<b>References</b>	<b>33</b>
<b>Annex 1: Key informants</b>	<b>35</b>
<b>Annex 2: Service provider models</b>	<b>36</b>
<b>Annex 3: Analysis of service provider models for trial in Timor-Leste</b>	<b>38</b>

## TABLE OF TABLES

---

Table 1: Functionality of water systems in Timor-Leste according to recent studies .....	5
Table 2: Six main causes for system failure based on studies in 2007-2011 .....	7
Table 3: Alternative service provider roles.....	17
Table 4: Life cycle cost components (adapted from Fonseca et al., 2011) .....	26
Table 5: Variations of community-based management.....	36
Table 6: Variations of public sector management.....	36
Table 7: Variations of private sector models.....	37
Table 8: Variations of self-supply models .....	37

## TABLE OF FIGURES

---

Figure 1: O&M within a service delivery approach .....	2
Figure 2: Three levels in service delivery approach .....	2
Figure 3: Common functionality problems viewed in Maliana and Atabae .....	4
Figure 4: Response to breakages and GMF fund collection .....	8
Figure 5: Virtuous and vicious cycles in management of water systems.....	8
Figure 6: Management responsibilities for different system scales and types.....	9
Figure 7: Division between community and SAS for jointly managed systems .....	10
Figure 8: Maliana SAS office, staff and spare parts for urban systems at warehouse.....	13
Figure 9: Three key accountability relationships to strengthen community management.	15
Figure 10: Spare parts shop, private sector company based in Dili .....	21
Figure 11: Capital maintenance interventions and how they maintain service levels .....	27
Figure 12: Delayed capital maintenance and resultant loss of service benefits .....	27



## Glossary

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ADN	National development agency
BESIK	Be, Saneamento, Igiene iha Komunidade (known also as Timor-Leste Rural Water Supply and Sanitation Program (RWSSP))
CAP	Community Action Plan
CapManEx	Capital maintenance expenditure
BOO	Build, Own, Operate
BOT	Build, Operate, Transfer
CBO	Community Based Organisation
CWSDO	Community Water and Sanitation District Officer
DA	District Administration
DNSA	National Directorate for Water Services
DNSAS	National Directorate for Water Services and Sanitation
DTO	District Technical Officer
GMF	Grupo Maneja Facilidade (water management group)
IPR	Independent progress report
MSATM	Ministry of State Administration and Territorial Management
O&M	operation and maintenance
OpEx	minor operation and maintenance expenditure
RWSN	Rural Water Supply Network
RWSSP	Rural Water Supply and Sanitation Program (see BESIK)
SAS	Servico de Agua e Saneamento
SIBS	Water Asset Information System
SDF	Sub-District Facilitator
NGO	Non Government Organisation
WASH	Water, Sanitation and Hygiene
WSP	Water and Sanitation Program of the World Bank



## EXECUTIVE SUMMARY

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Improving the sustainability of rural water service provision in Timor-Leste will require reorientation of the sector from an infrastructure focus to a service delivery approach. This report details research undertaken through BESIK (Timor-Leste Rural Water Supply and Sanitation Program (RWSSP)) on how this transition might be approached, with a focus on institutional options to improve operation and maintenance (O&M) of rural water systems. Recent international research on rural water service delivery provided both a conceptual framework to guide this study and comparable experiences in other countries to inform appropriate action in Timor-Leste. The report provides recommendations to the National Directorate for Water Services (DNSA) and other sector actors on how to improve the functionality and management of water systems through improving the existing community-based management model as well as trial of alternative provider models and addressing other systemic challenges in the sector.

Recent increased capital investment in the rural water sector in Timor-Leste is a positive step towards meeting the needs of rural populations, however this investment is undermined by the absence of a recurrent budget allocation to cover operation and maintenance, and the limitations of community-based management model which are recognised internationally and have been experienced directly in Timor-Leste. As a result, a minority of rural water systems are fully functional just one year after their installation.

The current institutional framework places communities as responsible for O&M for small systems, and gives joint responsibility to communities and DNSA for larger systems that cover more than three communities. Suggested improvements to this model include better developed planning and support processes for communities to undertake O&M, support to professionalise and formalise water management groups or Grupo Maneja Facilidade (GMF), and clarification of the division between DNSA/SAS (Servico de Agua e Saneamentu) responsibilities and community responsibilities, including questions of asset ownership, capital maintenance roles and cost-sharing arrangements. For DNSA/SAS to play their role in joint management, planning and budgeting is required combined with re-allocation of current district level human resources and on-going staff capacity building, including with respect to technical skills. Finally, a major information gap in terms of actual maintenance requirements and costs needs to be filled through commissioning an appropriate study of this nature, since this underpins the ability for communities or DNSA to undertake planning and budgeting of O&M.

Alternative institutional options for service provider models recommended for trial include variations on the current community management model, and engagement of private sector or NGOs (Non Government Organisations) contracted as service providers in the case of larger water systems. Variations of community management include GMFs outsourcing O&M functions to private individuals, and development of 'associations of GMFs' to provide certain O&M functions and services with greater economy of scale. Private sector or NGOs can be contracted by either communities or by intermediate level government (SAS or District administration), most likely through a lease management arrangement. Significant preparatory work is needed to lay the foundation for an effective trial of such models, including addressing existing gaps in the institutional framework (eg asset ownership) and addressing public financial management constraints in terms of multi-year commitments and fiscal decentralisation. Efforts to improve the supply chain for



spare parts and offering a national contact for specialised technical assistance (for instance for pump systems) are needed to underpin all service models.

Finally a range of other building blocks can reorient the sector towards a service delivery approach. Endorsement of sustainability indicators and targets to complement the current focus on coverage and Millennium Development Goal targets would provide a driver for shifting attention towards recurrent expenditure and sector capacity to sustain services in the long-term. Continuing to develop and promulgate quality standards for design and construction and to provision of effective support to community-based service providers through sub-district facilitators are critical. Investment is needed in a robust asset registration and information system to underpin O&M planning. And lastly, analysis of the breadth of life-cycle costs for different system types is needed to contribute to a stronger evidence base for planning and budgeting of on-going service delivery for all sector actors.

The above recommendations build on many positive developments that have already taken place in the sector in recent years, and whilst their breadth appears large, without moving forward across these different areas, solving the challenge of on-going operation and maintenance of rural systems cannot be achieved. The actions of DNSA, other government and non-government agencies outlined in this report support a transition to a service delivery approach, with the potential in the future to not only sustain, but augment the level of service received by rural communities.



# 1 INTRODUCTION

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*Providing rural water services is irreducibly complicated, and sometimes complex; there is no single solution to improving sustainability. Sustainable services rely on an interlocking network of different actors and institutions – all of which need to function at least ‘well enough’. Ensuring that rural water supplies are sustainable therefore means working with the ‘whole system’ – from regulation through provision of adequately resourced support services to ensuring oversight and accountability.*

Moriarty and Verdemato, 2010, p9

## 1.1 BACKGROUND

This report details research and analysis conducted under the Timor-Leste Rural Water Supply and Sanitation Program (RWSSP), known by its Tetum acronym BESIK. BESIK is funded by the Government of Australia through AusAID<sup>1</sup> to provide assistance to the Government and civil society organisations of the Democratic Republic of Timor-Leste for the development of rural water supply, sanitation and hygiene activities in Timor-Leste.

The objective of the study was to provide National Directorate for Water Services (DNSA)<sup>2</sup> with institutional options to ensure the on-going operation and maintenance (O&M) of rural water supply systems in Timor-Leste, drawing on global experience on transitions towards a service delivery approach. The outcomes from this study are also intended to provide an analytical basis for the next phase of Australian assistance to the sector, which has a strong focus on operation and maintenance. The study addresses the low system functionality and lack of sustainability which have been identified as major impediments to progress in the sector (IPR, 2010; ISF-UTS, 2011).

This research was undertaken with an aim to balance the need for short-term actions that respond to the critical need for a response to improve O&M of rural water systems now, with long-term strategic thinking that considers the re-orientation of the sector towards a service delivery approach, of which effective operation and maintenance is just one component within a larger picture.

The methodology comprised background analysis of the key determinants of functionality in Timor-Leste, investigation into the current knowledge of O&M requirements and costs, and consideration of the current institutional arrangements and human resources in the sector for implementation and service delivery. Conceptual frameworks for service delivery and costing drew on the recent extensive work of the IRC International Water and Sanitation Centre's Sustainable Services at Scale and WASH (Water, Sanitation and Hygiene) Cost projects. Interviews were undertaken in-country in with stakeholders from across various government and non-government counterparts and also included engagement with the private sector and a range of BESIK staff (see Annex 1 for details).

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<sup>1</sup> The Managing Contractor for the RWSSP is IDSS in association with GHD.

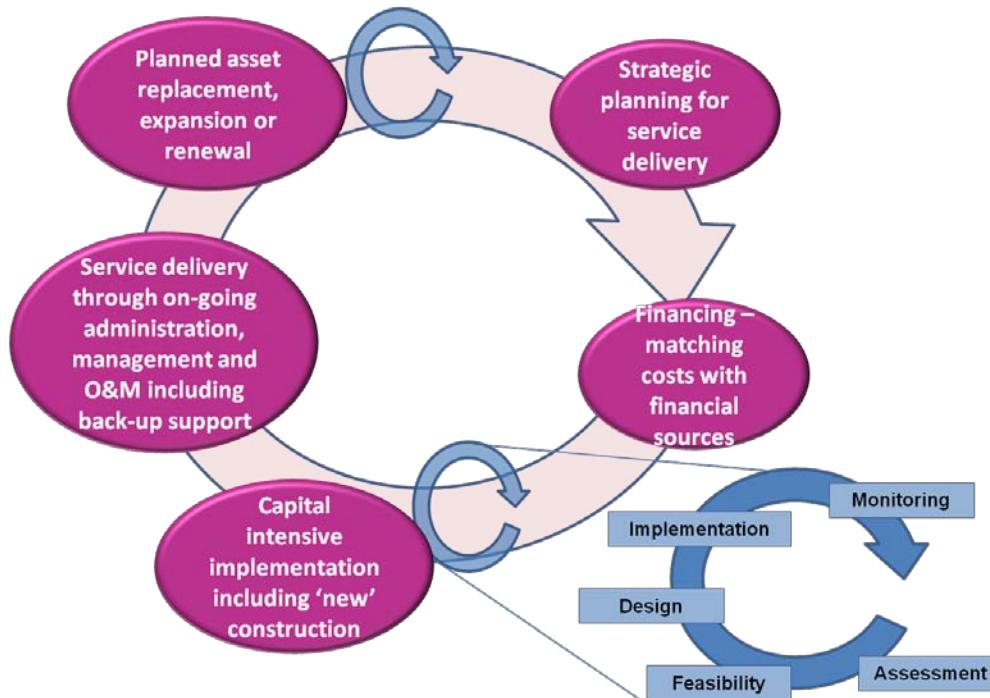
<sup>2</sup> Previously DNSAS, National Directorate for Water Services and Sanitation



## 1.2 OPERATION AND MAINTENANCE WITHIN A 'SERVICE DELIVERY APPROACH'

This report considers O&M within the broader concept of a service delivery approach. The reason for this is that O&M is interconnected with other areas, such as the existing institutional framework, management, accountability, technical quality, social dynamics, financial management, human resources and skills in the sector. To consider O&M as a solely technical function and in isolation of these would risk proposing unrealistic solutions. This is in line with international thinking and recent literature that advocates a focus on a 'service delivery approach' (Lockwood and Smits, 2011). This approach considers the system as a whole, and O&M as one function in this whole (see Figure 1).

**Figure 1: O&M within a service delivery approach** (Source: Lockwood and Smits, 2011)



A service delivery approach recognises three discrete levels: (i) the national or state level enabling environment (ii) service authority functions, often carried out by local government or devolved levels of national agencies; (iii) service provider, who performs the day-to-day management of a water system (see Figure 2).

**Figure 2: Three levels in service delivery approach** (Source: Lockwood & Smits, 2011)



## 2 CURRENT STRENGTHS & CHALLENGES IN THE RURAL WATER SUPPLY SECTOR

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The strengths and challenges described below are relevant to securing sustainability of service provision and effective operation and maintenance in Timor-Leste. Following this the key determinants of functionality are presented.

### 2.1 STRENGTHS

Timor-Leste demonstrates a number of strengths in its water supply sector. Firstly, the government gives high priority to the sector, visible through significantly increased investment over recent years, for example systems were built or rehabilitated in 237 aldeias in 2010 (IPR, 2010), complemented by significant investment by donors including AusAID (ISF-UTS, 2011). This commitment is confirmed in the Timor-Leste Strategic Development Plan which notes provision of an additional 400 water systems for 25,000 rural households in the next 5 years. In addition, recent hydro-geological studies confirm significant availability of groundwater resources in many areas (Wallace et al., 2011), in addition to surface water and springs which have been the traditional water sources for rural systems, some of which are variable depending on the season.

Community-based management has been introduced as the norm, and DNSA has directed significant effort towards improving social processes for generating ownership and capacity within communities to manage their systems, as well as developed technical norms and guidelines for design and construction, promulgated through the recently updated Rural Water Guidelines (2010). Decree 2004 and these guidelines provide at least some clarity about the distribution of roles and responsibilities within the sector.

Other important recent developments include the establishment of a national information system to track functionality, the addition to the government payroll of 88 sub-district facilitators (SDFs) to support community-management of rural water systems, and DNSA's development of a draft water policy with support from BESIK.

### 2.2 CHALLENGES

The Timor-Leste rural water supply sector also faces a range of challenges. Recent investment has been fragmented through a variety of mechanisms, which has resulted in lack of technical oversight and cases of poor quality construction. The level of acceptance around payment for access to water is low, reinforced by a lack of tariff collection for urban areas (Bond, 2009). Imbalance between capital investment and recurrent costs has prevented government from playing an active role to support proper operation and maintenance of water systems, resulting in very low levels of functionality (IPR, 2010) and the Timor-Leste Strategic Development Plan understates this requirement. This reflects a tendency towards short-term thinking and planning, with budgeting undertaken on an annual cycle with little attention to realistic mid-term expenditure planning (Mellors, 2011).

The norm of community-based management has been widely accepted and supported, despite the clear demonstration of its limitations and the growing international evidence



that communities struggle to maintain their systems. In Timor-Leste the history of oppression and mistrust poses significant challenges for community-based management, which relies on community cohesion to work well.

Overall the sector human resources are analysed to be well beneath what is needed for a functioning sector (Bond et al., 2009), with technical skills located mostly in the NGO sector, potentially to the detriment of building government and private sector capacity (IPR, 2010). The process of decentralisation was started but then postponed until after elections in 2012, and this overlays an uncertainty to the future institutional arrangements that will underpin the sector. Significant gaps are evident in the institutional framework around asset ownership and division of responsibilities, including 'who pays' between communities and government as regards various O&M functions. Lastly, although efforts have been made by donors to align to government systems, low capacity and inadequacies in the public financial management have slowed progress in this area.

## 2.3 CURRENT LEVELS OF FUNCTIONALITY

A range of studies and surveys in recent years provide insight on the current levels of functionality for the different types of water systems currently operating in Timor-Leste.. Hamel (2009b) reports that the majority of water systems in the two districts of Aileu and Lautem were gravity-fed (55%) followed by wells with bucket and rope (11%) then wells with powered pump systems (9%) and with a handpump system (7%). A synthesis of the findings of studies is shown in Table 1, demonstrating the majority of water systems are 'partially' functional, and that overall, the level of functionality is low.

**Figure 3: Common functionality problems viewed in Maliana and Atabae**

(Top left: unused water point due to solar pump failure, Top right: rusting pipe joint, Bottom left: mainline pipe leakage, Bottom right: leakage at intake)



**Table 1: Functionality of water systems in Timor-Leste according to recent studies**

Survey/ Study	DNSAS (2009/10) <sup>3</sup>	Plan RWSSP Baseline Survey 2009 (Hamel, 2009a)	Triangle 2007	Oxfam 2008 (Kamtukule, 2008)
Location	All districts	Aileu and Lautem Districts	Manatuto District	Covalima District
Systems surveyed	1868 aldeias	All systems in these districts	65 aldeias in 28 sucos, 6925 families	134 systems (gravity flow and hand pumps)
% fully functional	<ul style="list-style-type: none"> <li>23% of spring-source piped systems</li> <li>21% of hand-dug wells with bucket</li> <li>4% of hand-dug wells with hand pump</li> <li>39% of bores with electric pump</li> <li>67% of bores with solar pump<sup>4</sup></li> <li>34% of bores with hand pump</li> </ul>	<p>Overall, 30% still functioning after 1 year, and 15% after 6 years.</p> <ul style="list-style-type: none"> <li>22% of gravity-fed systems (but only 15% of large gravity-flow systems)</li> <li>13% of power pumped systems</li> <li>18% of wells with bucket/rope</li> <li>5% of hand-pump systems</li> </ul>	14% of 65 systems (58 gravity fed systems and 7 pump systems (3 solar, 1 ram hydraulic and 3 submersible))	44% of piped systems 41% of hand pump systems
% partially functional	<ul style="list-style-type: none"> <li>52% of spring-source piped systems</li> <li>39% of hand-dug wells with bucket</li> <li>68% of hand-dug wells with hand pump</li> <li>50% of bores with electric pump</li> <li>19% of bores with solar pump</li> <li>55% of bores-hand pump</li> </ul>	<ul style="list-style-type: none"> <li>63% of all gravity-fed systems</li> <li>75% of large gravity-flow systems</li> <li>13% of power pumped systems</li> <li>82% of wells with bucket/rope</li> <li>63% of handpump systems</li> </ul>	68%	30% of piped systems
% non- functional	<ul style="list-style-type: none"> <li>24% of spring-source piped systems</li> <li>16% of hand-dug wells with bucket</li> <li>28% of hand-dug wells with hand pump</li> <li>3% of bores electric pump</li> <li>10% of bores with solar pump</li> <li>4% of bores- hand pump</li> </ul>	<ul style="list-style-type: none"> <li>10% of gravity-fed systems (including large gravity systems)</li> <li>70% of power pumped systems</li> <li>0% of wells with bucket/rope</li> <li>32% of handpump systems</li> </ul>	18%	26% of piped systems 59% of hand pump systems
How function- ality was defined	<p>Fully functioning: all components of the improved water system are operating.</p> <p>Partially functioning: part of the network (multi-aldeia systems) is not operating or there are taps stands without water (single-aldeia system)</p> <p>Not functioning means the connection to the source is not working and no one has access to the water from the improved water system</p>	<p>'Fully functioning system' if:</p> <ol style="list-style-type: none"> <li>Appropriate quantity of water less than 100m to 80% of the aldeia;</li> <li>Permanent source of water through the year</li> <li>No major problem of water quality</li> <li>No or limited number of missing or broken elements</li> </ol> <p>If one or more criteria not fulfilled, then 'Partially functioning'.</p>	<p>Functioning if there is:</p> <ol style="list-style-type: none"> <li>Sufficient and permanent water production (minimum of 30 l/p/d at the tank and tap flow of minimum 0.1 l/s), Of suitable quality</li> <li>With a functional maintenance level.</li> </ol>	<p>For piped systems, if all taps running</p> <p>Functional: if all taps running</p> <p>Partially functional: if some taps not running</p> <p>Non-functional: all taps were not running</p>

<sup>3</sup> Sourced from the SIBS data system<sup>4</sup> This figure is higher than expected and likely due to the small sample size for solar pumps

## 2.4 KEY DETERMINANTS OF FUNCTIONALITY

It is important to consider both enablers and barriers that contribute to on-going functionality of water systems. A recent study in Timor-Leste provides insight into **enablers** that contribute to on-going functionality of systems (de Araujo and Madden, 2011). These include the following:

- **Supportive relationship between GMF and community through close integration of community leadership** (Chefe aldeia and or Chefe Sucos) with GMF, inspiring sense of ownership of the water system and commitment to regulations (eg fines and application of tara bandu<sup>5</sup>) and monitoring by community, GMFs and SAS
- **Active GMF with clear roles that are operationalised** where GMFs undertake regular meetings, collect fees and undertake O&M in a responsive, proactive manner (for example, daily cleaning of water point, weekly walks along pipeline checking for leaks, regular cleaning of water source (especially in wet season)), often including key roles by women. Effective community activity plan (CAP) processes used during establishment of GMF that set up clear O&M processes and responsibilities and collection of finances according to a variety of models (monthly fees collected by GMF, cooperative model and micro-finance model).
- **External support provided to GMFs and communities through either** on-going involvement of NGOs to strengthen community or GMF capacity, close working relationship with district Water and Sanitation Services (SAS) offices and District Administration (DA) offices, or through establishment of a WASH Steering Committee at sub-district level chaired by the Sub-district Administration, and including membership from all district government services, NGOs, the church, other community groups, Suco Councils and GMFs.

Several studies conducted between 2007 and 2011 clarify the **main reasons for system failure**. Failure of community management cited as the primary cause, followed by technical issues then social issues (Hamel, 2009a). Further detail these and other causes reported, such as lack of institutional support, inadequate supply chains, and environmental causes are shown below in Table 2. These are synthesised from the following studies: Hamel, 2009a; Kamtukule, 2008; Triangle, 2007; Hamel, 2009a; Hamel, 2009b; Murta, 2010, De Araujo and Madden, 2011. Many of these challenges are magnified for larger systems that service several aldeia (Murta, 2010).

Some of these challenges, particularly those relating to the community management model, have recently been addressed through strengthened community engagement, survey and design and post-construction activities (BESIK, 2011). For instance 200 trained facilitators have improved community participatory planning processes and also trained approximately 600 GMF members, including a significant proportion of women, in O&M and financial literacy skills. Preliminary evidence shows significant improvements in functionality of systems after one year, and further information will become available during 2012.

<sup>5</sup> Tara bandu tradition places restrictions and prohibitions upon water catchment areas and punishments are undertaken restrictions are not followed



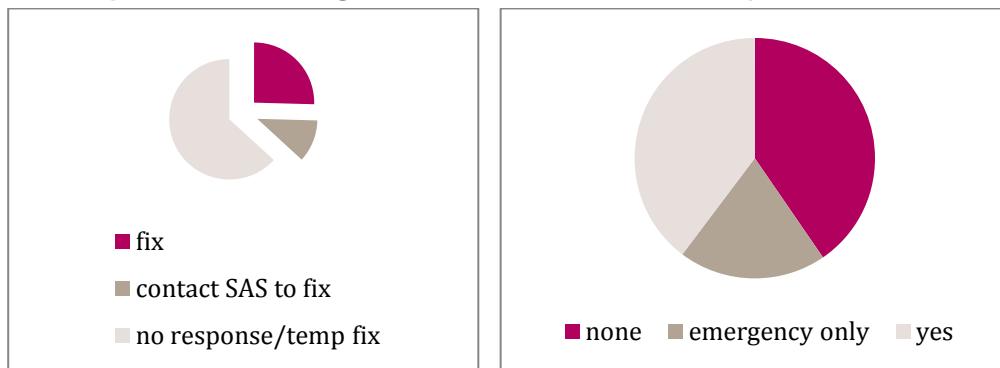
**Table 2: Six main causes for system failure based on studies in 2007-2011**

Limitations of the community management model	Inadequate supply chain for spare parts	Technical issues
<ul style="list-style-type: none"> <li>- lack of an active GMF (46% of systems in Hamel (2009a) and 40% of piped systems in Kamtukule (2008) studies)</li> <li>- GMF role not known or understood by GMF and/or by the community</li> <li>- lack of GMF experience in maintenance including apprehension for fear of breaking something, and tendency to repair systems with rubber bands and stop-gap measures</li> <li>- GMF fearful of exacerbating inequities in supply through maintenance tasks</li> <li>- Under-representation of women in GMFs and training</li> <li>- GMF members faced with competing priorities for their time</li> <li>- lack of funds to undertake O&amp;M (9% of GMFs had a fund in Kamtukule, (2008))</li> <li>- reluctance to spend saved GMF funds on small or large system repairs</li> </ul>	<ul style="list-style-type: none"> <li>- lack of transport, time or money for travel to Dili (cost of transport can exceed cost of the spare part)</li> <li>- lack of financial compensation for the community-member's lost time in travelling to Dili</li> <li>- confusion in GMF as to where to buy appropriate part</li> <li>- lack of access to spare parts or technical expertise for powered pump systems</li> <li>- kits of spare parts left with communities lost or mis-managed</li> <li>- small businesses report lack of financial capacity to import parts from Indonesia</li> </ul>	<ul style="list-style-type: none"> <li>- excessive particles in surface water causing blockages</li> <li>- inadequate or inappropriate system design (for instance systems diesel and solar powered pumps demonstrated a higher failure rate (70%) than other systems (Hamel, 2009a)</li> <li>- use of low-quality materials (pipes, concrete etc.)</li> <li>- pipes left unburied subject to damage by animals or other causes</li> <li>- lack of systems for ensuring 'as-built' designs are kept and available</li> <li>- high water pressure leading to breakage</li> <li>- cracks in storage tanks resulting in water losses</li> <li>- taps broken and pipes leaking</li> </ul>
<b>Social issues within communities</b> <ul style="list-style-type: none"> <li>- conflicts within and between communities</li> <li>- theft and vandalism, illegal connections</li> <li>- lack of community faith in the GMF</li> <li>- low levels of satisfaction with the level of service</li> </ul>	<b>Lack of institutional support</b> <ul style="list-style-type: none"> <li>- lack of support or communication to GMFs</li> <li>- lack of monitoring to ensure GMF functioning and O&amp;M undertaken</li> <li>- lack of clarity in community and in GMF about government's role</li> <li>- SAS offices under-resourced with limited human resources, computer systems, electricity, limited or no budget for spare parts, fuel or allowances</li> <li>- Limited private sector participation</li> </ul>	<b>Environmental issues</b> <ul style="list-style-type: none"> <li>- landslides and natural disasters destroying gravity-fed systems</li> <li>- reduced water availability at source</li> <li>- farming practices that interfere with water resource management, including clearance of land near sources</li> <li>- flooding of rivers and gullies, resulting in pipe breakages</li> </ul>



The low level of response to breakage of a water system and the low level of funds collection by GMFs as measured by DNSAS surveys in 2009 are shown in Figure 4. Kamtukule (2008) also observed the predominance of “ad hoc collection is initiated when there was a crisis”.

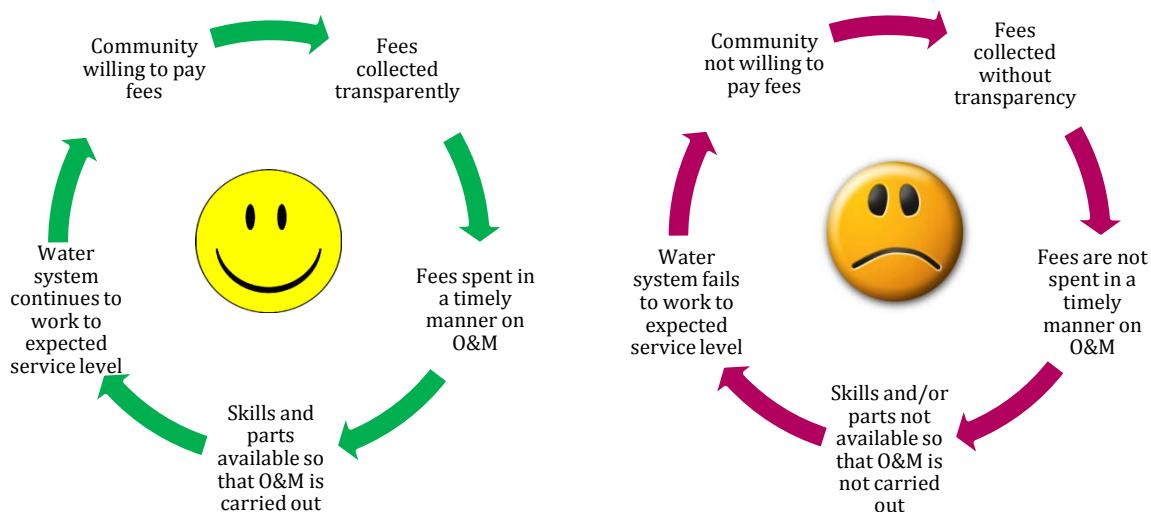
**Figure 4: Response to breakages and GMF fund collection (Source: DNSAS, 2009)**



## 2.5 CYCLES OF MANAGEMENT AND MAINTENANCE

Operation and maintenance is part of a wider system of management and service provision to an expected service level. In many cases in Timor-Leste, systems are caught in a vicious cycle, and the challenge is to shift this dynamic to a virtuous cycle of sustainable service provision. Figure 5 presents a simplified view of these management cycles. A more complex view of management functions include the following: tariff collection, money keeping, book-keeping, tariff setting, regulation, reporting, operation, maintenance, surveillance, monitoring and information collection, technical assistance, training, coordination and facilitation (Murta, 2010), all of which are necessary in addition to actual technical O&M functions for a system service to be sustained in the long-term.

**Figure 5: Virtuous and vicious cycles in management of water systems**



### 3 IMPROVING THE CURRENT COMMUNITY MANAGEMENT MODEL

This section describes the current institutional arrangements for how service delivery, including management and O&M, and how they are expected to be carried out according to the current legal and institutional framework. This section also suggests modifications to strengthen sustainability whilst working within the confines of the model defined by current legislation. Following this, Section 4 proposes options based on more significant changes to the current model that would involve updating current policy and legislation for how rural services are delivered.

First, it is important to note that internationally, although the community management model is the most widespread approach to rural water supply in developing countries, its limits have become increasingly clear across multiple countries and it is widely accepted that communities struggle to maintain their systems alone (Lockwood, 2004; Schouten, 2006; Aguasan, 2008).

#### 3.1 DESCRIPTION OF CURRENT MODEL

According to Decree Law No. 4/2004, outside of urban centres, water supply systems are to be community run and managed by water management groups or Grupo Maneja Facilidade (GMF). Customary rules are expected to be used for selecting members, collecting fees, allocating and distributing water, and resolving disputes. The Decree does also make provision regarding support to GMFs in the form of technical assistance, and potential government responsibility for complex and main piping systems for larger systems across several communities, in return for a fee from communities to cover administrative and maintenance costs.

The Rural Water Guidelines (2010; p5) elaborate on this arrangement, taking further steps to clarify the division of roles and responsibilities between GMFs and SAS for different system types (see Figure 6). For multiple community systems, the Guidelines propose that each aldeia have a GMF, and that each water system will have an overall coordinating body made up of representatives from each GMF.

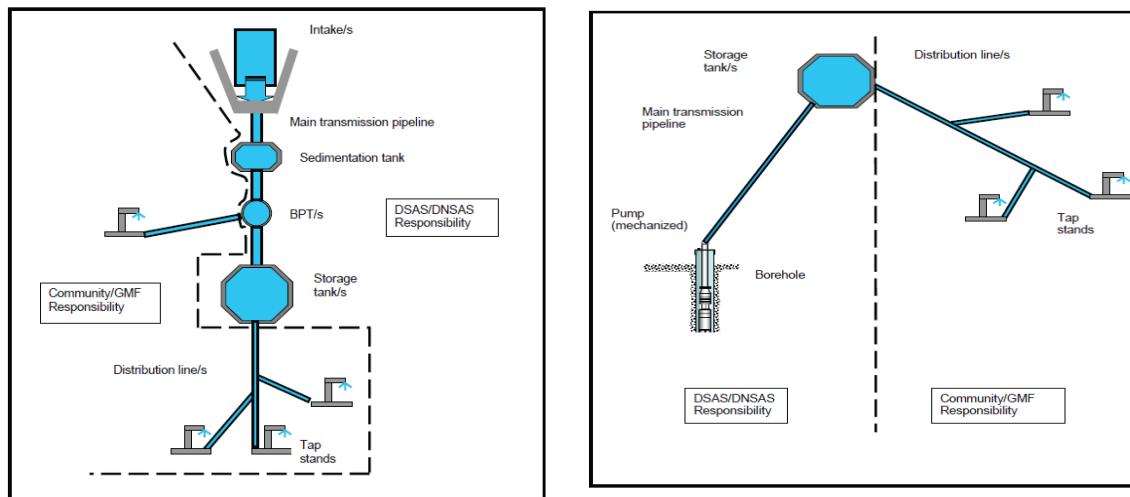
**Figure 6: Management responsibilities for different system scales and types according to Rural Water Guidelines (2010)**



For systems under joint management, the guidelines also specify a physical boundary between community responsibility and SAS responsibility, as shown in Figure 7.



**Figure 7: Division between community and SAS responsibility for jointly managed systems**



The Guidelines further mention that after three years, GMFs are expected to be independent, but that 'major repairs' will remain the responsibility of DNSA, however what constitutes a 'major repair' is left unclear. Other areas which lack clarity include cost-sharing arrangements between communities and government, asset ownership, responsibilities for capital maintenance (capital replacement and rehabilitation at the end of systems or component parts' lives) and responsibilities for maintaining asset records. Box 1 also demonstrates the successes and challenges faced in operationalising this model, including paid individuals to undertake O&M.

**Box 1: Example of management of a multi-village system: The Tapo system in Bobanaro** covers several aldeias and is jointly managed by communities, their respective GMFs, SAS and the Sub-District Administration. Water service tariffs were decided by the communities and are adjusted for different types of tap connection users: public, private, and social tap connection users at \$0.50, \$1.00 and \$1.50/month respectively. Fee collectors and distribution system operators receive a \$20/month 'incentive', and two caretakers look after the mainline and are paid \$80/month, all of which is to be paid from the fees collected. At the time of this research, challenges had recently been faced with regard to transparency in fee collection and delayed payment to the caretakers, resulting in tensions, vandalism and leakages in the system due to lack of maintenance.

## 3.2 STRENGTHS OF CURRENT MODEL

The strengths of the current model are many. First, it is pragmatic that in remote rural communities, the people who are present there are able to contribute to the system's management. Also, one of the benefits of community management is that communities feel a sense of ownership over their water system, which is potentially empowering. They are also given the chance to develop skills in managing the water system, including financial management, negotiation skills, taking responsibility, accountability and technical skills, all of which may be applicable to other areas of personal and community



development. In recent years the strengthened involvement of women in GMFs and water management provides potential for their empowerment towards greater gender equality.

A number of other areas demonstrate relative strengths of the Timor-Leste model of community management as compared with other countries. First, the fact that GMFs are mentioned in Decree 2004 gives these groups some legitimacy. Second, the inclusion of responsibilities for government to provide support to community management in the Decree is important, and something that is absent in many other countries. Finally, significant effort has been invested in recent years in improving both the Community Action Plan (CAP) to address many of the causes of GMF failure, and the promulgation of technical design and construction standards and guidelines (which as of January 2012 must be followed by all agencies constructing new systems<sup>6</sup>). These two developments are useful steps to address the problems described in functionality studies of 2007-2011.

### 3.3 POTENTIAL IMPROVEMENTS TO CURRENT MODEL

Nine areas for improvements are identified below that pertain to the **GMF role in O&M** of the current model, all of which would require leadership by DNSA to implement. Some of these improvements will be discussed in further detail in Section 4 as part of the building blocks to shift the rural water sector towards a service delivery approach.

- (i) **Collaborative development of an O&M task plan for every water system / GMF**  
An extension of the current community-action plan (CAP) process is required to ensure development of an O&M plan, potentially in the form of a calendar, or other appropriate format to record tasks and their timing. This plan would clearly mark specific preventive and corrective O&M tasks and allocate responsibility for them, ensuring that both women and men have the chance (and are supported) to take on relevant roles. The plan could be kept at a central place or by a responsible person within the GMF, and actions undertaken on the system could be recorded. Such a plan could be used as a leverage point for accountability so that a Sub-District Facilitator (SDF) (for instance) could monitor and support its implementation.
- (ii) **Development of a financial O&M plan for every system.** This could be developed based on contributions by the relevant design engineer, GMF and SAS/DNSA staff. Such a plan would predict on-going operation costs as well likely predicted on-going maintenance costs. Broad estimates will be necessary at first until more comprehensive spare parts and cost information has been collected in the sector. Mechanisms to cover the costs over time would then need to be identified and negotiated. Such plans should be developed even before decisions to implement a water scheme are taken so that the long term financial implications are understood.
- (iii) **Systematic study to collect information on maintenance requirements and related costs** for a sample of different types of water systems is needed to support the above recommendation. At present there is limited information in Timor-Leste to allow projection of costs into the future for adequate maintenance. Systematic collection of such information is critically needed to assist GMFs, SAS and DNSA plan and budget O&M. The WASHCost methodology would be useful to apply.

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<sup>6</sup> Resolution by the Prime Minister, January 2012



(iv) **Practical mentoring and follow-up to O&M training.** O&M training has been provided to some GMF's through BESIK (BESIK, 2011), and other NGOs also offer O&M training (WaterAid, 2010). O&M training needs both to be extended to women and men in all GMFs, and needs practical follow-up such that those people trained are mentored through their first experiences of fixing any broken parts on their system. Support around the social processes to ensure money is available and to ensure appropriate authority is given to those taking a technical/O&M role to make decisions regarding purchase of new parts is needed.

(v) **Incentives for well-performing GMFs** may be useful to encourage good O&M and management practice. Such incentives could take many forms. For instance, in Indonesia community-based organisations were offered additional training towards allowing them to become 'bankable', to borrow funds, and to upgrade their systems towards greater numbers of household connections (Sy, 2011).

(vi) **DNSA to further clarify the division between SAS and GMF roles in O&M:** As mentioned above in Section 3.1 describing the current model, despite some clarity provided by the division of responsibilities based on physical parts of a water system, there remain unanswered questions in the share of responsibilities between communities, GMFs and government. The following questions and areas require discussion and attention:

- Is it appropriate that communities cover all costs of the system (including in the case of joint management) as appears to be expected in Decree 2004?
- If community fees are expected to cover all (or even a given portion) of on-going O&M costs then new approaches to calculate tariffs will be required that take into account the real costs of O&M, as currently fees appear to be set mostly on the basis of willingness to pay. Clarification is needed about the costs to SAS to play their role as well as decisions about if community fees should contribute to these.
- Are communities 'service providers' only, or also owners of the water system as an asset? Ownership has implications for norms around who would be expected to pay for larger maintenance requirements (termed capital maintenance) which include replacement or rehabilitation of the system or system components. Usual practice is for this cost and responsibility to lie with the system owner and not with the service provider (WSP, 2010).

(vii) **Professionalise and formalise GMFs:** There are several elements to this recommendation which will be discussed further under Section 4.1. These include decisions required by DNSA about formal registration of GMFs and mechanisms for strengthening accountability of GMFs and roles within the GMF.

(viii) **Improve direct support to GMFs:** Direct support<sup>7</sup> covers a number of mechanisms that can support GMF as service providers, and is discussed further in Section 4.5.

(ix) **Improve access to specialised technical assistance and to spare parts.** GMFs may require specialised technical assistance, for instance in the case of solar or diesel pumps, and also require easier access to the required spare parts at adequate quality. This area is discussed further in Section 4.10.

<sup>7</sup> Direct support is sometimes termed 'post-construction support', however the term 'direct support' is used in this report as international experience indicates that on-going support is needed to service providers, not just in the post-construction period



**DNSA/SAS role in O&M as part of joint management** for larger multi-village systems (as explained in Section 3.1) includes to:

- Undertake preventive and corrective maintenance in of the intake, the mainline, sedimentation tank, break-pressure tanks, storage tanks and powered pumps
- Plan and develop annual budget for the above maintenance tasks
- Ensure necessary spare parts are available at district level
- Make available appropriately skilled personnel to carry out the required tasks

Operationalising the above responsibilities would require DNSA to:

- Develop a budget estimate and advocate to secure this as well as improvements in financial management to give authority and access to funds at district level
- Re-arrange and develop the roles within district SAS offices to ensure adequate technical skills are available to support jointly managed rural systems:
  - On-going training to CWSDO (Community Water and Sanitation District Officer) and SDFs in technical skills (both to ensure SAS role in joint management, and also to oversee GMF O&M activities)
  - Urban O&M staff to potentially also maintain rural systems
  - Clarity of role of DTO (District Technical Officer) for rural systems
  - Authority of the SAS manager to ensure balanced allocation of resources to urban and rural systems
- Establish an information system or asset register that allows SAS to undertake O&M planning for all systems requiring joint management. A paper-based system could be used as a starting point.
- Establish mechanisms for communities/GMFs to notify SAS of problems in the part of the system for which SAS is responsible.
- Ensure spare parts for rural system main-lines of large systems etc. (SAS responsibility) are available, either through out-sourcing this service or using existing warehouses currently housing parts for urban systems
- Clarify at the national level as to the appropriate cost-sharing arrangements between SAS and communities, including 'who pays' for O&M personnel working on the part of the system for which SAS is responsible, and for any spare parts.
- Another agency (potentially the District Administration) to play a 'service authority' role, with oversight responsibility of SAS's service provision role in maintaining certain components of rural systems.

**Figure 8: Maliana SAS office, staff and spare parts for urban systems at warehouse**



## 4 BUILDING BLOCKS TOWARDS A SERVICE DELIVERY APPROACH

Recent international research on rural water supply describes the building blocks that assist a sector to move from an ‘infrastructure’ focus to a service delivery orientation (Lockwood and Smits, 2011)<sup>8</sup>:

1. Professionalise community management	6. Provide direct support to service providers
2. Promote alternative service provider models	7. Provide capacity building to service authorities
3. Support availability of parts & specialised technical assistance	8. Plan for asset management
4. Set sustainability targets and indicators	9. Undertake planning and budgeting based on life cycle costs
5. Standardise norms and procedures	10. Regulate rural services
	11. Promote learning and sharing

Each of these building blocks is described below in terms of actions and strategies that will assist development of a service delivery approach in the context of Timor-Leste. Within this analysis, examples are provided of successful approaches from other countries internationally that may be applicable in Timor-Leste.

### 4.1 PROFESSIONALISE COMMUNITY MANAGEMENT

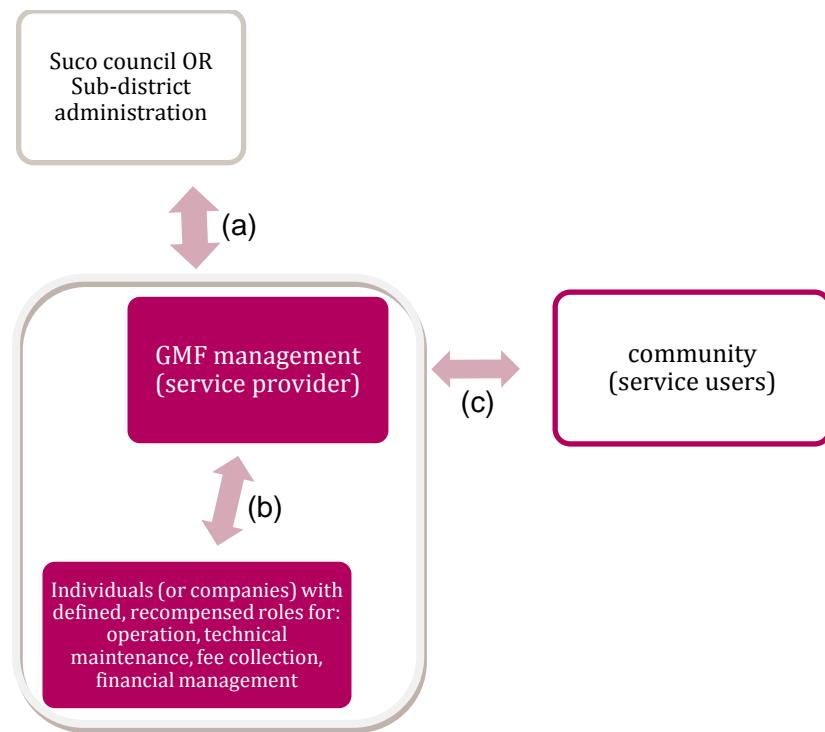
Internationally, there has been a trend towards increasing professionalisation of community management. The drivers for this trend include demand to move up the service ladder (e.g. to greater numbers of household connections), lower willingness in communities to perform ‘free’ services, and a change in philosophy among policymakers to see water services as an important public service that requires a professional service provider (Lockwood and Smits, 2011).

There are several elements to this increased professionalisation. In general it represents a strengthening of responsibility and accountability, in the place of current informal and voluntary arrangements. Such an arrangement is shown in Figure 9.

<sup>8</sup> Item 3, ‘support availability of parts and specialised technical assistance’ is not part of Lockwood and Smits (2011) building block, however has been added here due to its relevance in Timor-Leste



**Figure 9: Three key accountability relationships to strengthen community management (a), (b) and (c)**



A formalised relationship between a GMF and the suco council or sub-district is the first level for improvement of accountability<sup>9</sup>. This accountability relationship is labelled (a) in Figure 9. GMFs could be required to officially register themselves, including their structure and composition, with the relevant body (as suggested in the Rural Water Guidelines 2010; p11) with records kept at the DSAS office. For this registration process to impact on the accountability of GMFs, then a service agreement would need to be developed that outlines the GMF's responsibilities for which they would be held to account by the suco council or sub-district, and mechanisms to monitor GMF performance put into place.

Another aspect of professionalisation is separating out of certain 'operations' functions, such that the GMF retains management and decision-making power, but separate tasks such as O&M are formally delegated to individuals (or in some cases local companies) (Lockwood and Smits, 2011). This accountability relationship is shown by (b) in Figure 9. In many cases this would mean clarifying and properly recompensing roles of individuals who take on active roles within the GMF (or potentially contracting of certain roles outside the GMF). Written agreements between GMFs and individuals would be required, and incentives could potentially be provided, for instance if the water system is functioning well. This is already happening in some locations in Timor-Leste (Box 1), where individuals are paid for their role in supporting management of a water system.

<sup>9</sup> Which body is most appropriate is currently unclear. Suco leaders are elected by the people, however suco council does not have a clear linkage to the sub-district administration. Current revisions to the roles and responsibilities of suco councils and leaders as well as new processes for development of suco development plans that are underway may help clarify this issue



Finally, the accountability relationship between communities and GMFs (shown as (c) in Figure 9) can be improved by clarifying expectations about acceptable service levels on both sides and developing effective approaches for on-going communication and engagement between GMFs and communities about services, tariffs, consequences of non-payment, transparent reporting of finances etc. between GMF and community.

Other aspects relating to professionalisation include improving performance-based management and adoption of good business practices. Foundational organisational practices such as planning, budgeting, systems and procedures for financial reports and asset recording represent some of the core practices that GMFs will need to be supported to develop over the long-term. In some countries gradual professionalisation of community-based organisations is then leading to the possibility of expansion of services to those who are unserved (see Box 2). Considerable information is available about how other countries are working towards professionalising community-based service providers, including in Indonesia (Sy et al., 2011) and internationally (Smits et al., 2011; Lockwood and Smits, 2011). In Timor-Leste there is also possibility that GMFs can access micro-finance institutions towards supporting their service delivery role.

**Box 2: In Indonesia the possibility to transformation of previously informal water committees to service-oriented enterprises able to upgrade and extend their services is being investigated.** This involves professionalisation of organisational systems of these community-based organisations (CBOs). For example annual planning and budgeting, incentives and allowances for volunteers, systems and procedures for financial reports and asset recording. World Bank's Water and Sanitation Program (WSP) has been assisting development of the 'next generation' of CBOs by providing support to CBOs to access commercial finance through CBO reforms such as obtaining legal personalities, appropriate licences, credit-worthiness through realistic tariff and better collections and management. Local governments are being asked to take on oversight, rather than implementation roles, and to consider adopting local regulations that set out the rights and responsibilities of CBOs and processes for licensing, review and reporting. Financial institutions were invited to form partnerships, resulting in partnerships with seven rural banks offering loans to CBOs.

Sources: Sy, 2011; Indll, 2011; Lazarte, 2011

## 4.2 PROMOTE ALTERNATIVE SERVICE PROVIDER MODELS

There are many possible alternative service providers beyond the current model of community management. It is also possible to extend and broaden the existing community management model to include private and not-for-profit roles. Table 2 shows the breadth of different service providers and notes their current applicability, on the basis of this research, in Timor-Leste. Options include public sector, private providers, and self-supply<sup>10</sup>. Further analysis and evidence is provided in Annex 2 where variations of each model are provided in more detail.

<sup>10</sup> Self-supply refers to private investment to improve their own water service and where O&M is undertaken by the household (or groups of households) and according some definitions of 'access' refers to those who



**Table 3: Alternative service provider roles**

Model	Description	Applicability in Timor-Leste
Community-based management and variations	<p>GMFs responsible for operation and minor maintenance of distribution systems.</p> <p>Potential variations include out-sourcing individual or all O&amp;M roles to:</p> <ul style="list-style-type: none"> <li>• individuals</li> <li>• NGOs</li> <li>• associations of GMFs</li> <li>• private sector operator (operating within a geographic area, or for a certain system type).</li> </ul> <p>SAS responsible for 'major repairs' and for common components in large systems under joint management</p>	Variations should be explored for small and for larger systems
Public sector management models	SAS responsible for management and O&M for rural systems that are nearby to urban areas.	Not feasible with current human resources and not in line with Strategic Development Plan
Private sector models	<p>Public-private partnerships in which service provision is contracted out (by a service authority- either DNSA, SAS, DA or other government agency) to a private sector operator.<sup>11</sup></p> <p>Potential variations include whether this takes place through a lease arrangement, or whether the private operator builds and operates the system under license. Another variation is contracting of service provision to an NGO rather than a private company.</p>	Yes, should be explored for larger systems and urban areas, is in line with Strategic Development Plan. Requires significant preparatory work before trialling
Self-supply	Individuals and groups of household invest privately in their own water supply arrangements and operate and maintain them.	Potential to recognise and support self-supply in remote areas where provision of improved services is challenging.

In moving beyond the current management model for service provision and O&M **the following models are recommended for trial in Timor-Leste over the coming years.**

(i) Continue to evolve and extend the current community-based management model in the following two ways:

- Current model with certain O&M functions outsourced by GMF to private individuals (from within or outside the community) (as described in previous Section 4.1)
- Current community-based management model with certain O&M functions carried out by an "association of GMFs" who can reach an economy of scale

are unserved. In several countries self-supply is recognised (and even promoted) in sector policy including Ethiopia, India, Thailand and Uganda, (Lockwood and Smits, 2011; p85)

<sup>11</sup> This arrangement was also suggested by the BESIK IPR (2010) which recommended: "smart incentives to bring the private sector into longer-term, performance-based contracts with communities, possibly using output-based and approaches" (IPR, 2010; p21)



- (ii) For larger systems (those currently under joint management or urban areas under SAS management), consider new institutional arrangements:
  - o Community-based management with service provision functions (fee collection, O&M etc.) contracted out to an NGO or private company
  - o Public-private partnership in which a government service authority contracts a private operator for service provision under a lease arrangement or where the private operator builds and operates the system
  - o Public-private partnership in which a government service authority contracts an NGO for service provision under a lease arrangement

For the two **variations on community-based management**, trialling of these models may be undertaken within the current institutional framework, though the legal status of GMFs (and hence their ability to contract and outsource O&M functions) may need to be clarified. For the formation of an **association of GMFs**, Decree Law No. 5 - 2005 lays out the procedures for forming this kind of non-profit making corporate body.

The current example of associations in Timor-Leste is the Federation of GMFs located in Maubara, a forum of 32 GMFs in the sub-district, which was formed with support from WaterAid. This association has a dual function of providing mutual support and improved service provision by the GMFs, as well as to strengthen their voices at district level and to represent members' interests during discussions with the government (WaterAid, 2011). The kind of association proposed in this report, is an association with a narrower focus on providing O&M support to GMFs. The kinds of O&M functions an association could offer include procuring and storing common spare parts, offering a preventive maintenance and monitoring service, and potentially providing 'direct support' to GMFs (discussed further in Section 4.10). Such an association could potentially charge for the services provided, and could also potentially access government funding (if made available) to support its operation and services as happens in other countries (see Box 3).

Box 3: Example of associations are many. In the US, support, technical advice and capacity building are provided by the Rural Community Assistance Partnership (RCAP) and the National Rural Water Association (NRWA), which organises the circuit rider program of technicians who provide support to rural operators. Both are 'bottom-up' organisations providing support to members, and are well linked into government funding systems both at federal and state level.

In Columbia an example of a civil society initiative is the Asociación Colombiana de Organizaciones Comunitarias Prestadoras de Servicios de Agua y Saneamiento (AQUACOL) (Colombian Association of Community-Based Water and Sanitation Services Providers) which facilitates mutual support between its members.

In Burkina Faso an association of Water Schemes provides support to 41 individual water user associations.

Source: Lockwood and Smits, 2011

For alternative **service provider models for larger water systems**, the three suggested models involving **private sector and/or NGOs** will require significant ground-work before they could be trialled. Private sector development is part of the Timor-Leste Strategic Development Plan. Annex 3 contains further analysis regarding the associated enabling environment, service authority and service provider requirements that would need to be addressed to facilitate a meaningful trial of these models. Box 4 provides a short review of



usual arrangements and key learning from involvement of private sector in rural water supply internationally.

**Box 4:** There are many examples of **private sector operators** internationally. In ten countries in Africa, 25% of piped systems are currently under delegated management to private sector and this proportion is rapidly growing (WSP, 2010a). **Management and affermage/lease arrangements are most common** which are 1-3 years and operators only finance small investments (WSP, 2010a) however longer leases of 10-15 years may be more realistic as short-term duration doesn't allow sufficient time to recoup investments (WSP, 2010b). Other possibilities include: Build-operate-transfer (BOT), build-own-operate (BOO), rehabilitate-operate-transfer (WSP, 2010b). Contracts are usually awarded based on competitive tenders and providers include individual entrepreneurs, micro- and medium size businesses.

**Key ingredients for success** with regard to rural water systems include financial and managerial autonomy, transparency and accountability, professional support, competition, legal framework and independent regulation, demand-responsiveness and incentives for expansion (WSP, 2010a). The actual contract is central to the success or not, and attaining the appropriate level of specificity and detail in the contract is critical (WSP, 2010a). Private sector entrepreneurs need to be supported to develop viable business plans and to access initial investment funding, which can be challenging, (WSP, 2010a).

**Usually the asset holder is the contracting authority, and in many countries there is confusion and uncertainty around asset ownership which must be resolved.** In countries that have undergone decentralisation, this role usually lies with local government (for instance in Benin, Burkina Faso, Mali and Rwanda) (WSP, 2010b). At times the contracting authority is also water user associations (for example in Nigeria) (WSP, 2010b) and in Senegal this approach will soon be favoured in national policy (WSP, 2010c). In Benin, tri-partite arrangements between local government, water users associations and private operators are used (WSP, 2010b). Support is needed for the contracting authority to play their role, such as that given in Mali, including technical diagnostics of the water scheme, business planning, model contracts, tendering and bid evaluation support (WSP, 2010a).

Sources: WSP 2010a; WSP, 2010b

Although the Timor-Leste Strategic Development Plan places emphasis on private sector development, significant support is needed to build this sector and capacity. So although companies have been 'mushrooming' due to the large number of government contracts in recent years, the concept of a private sector is relatively new. The Institute for Business Support (IADE) does offer skills training on how to start small businesses. The Chamber of Commerce is tasked with a role of coordination between private sector and government however according to private sector interviewees has not adequately fulfilled this role as yet. With this as the backdrop to any private sector engagement in rural water supply, steps should be taken cautiously.

Recommended preparatory steps in Timor-Leste before trial of these arrangements are:

- **Market analysis study of the private sector** (and NGO) capacity: numbers of potential companies and their location, size, human resources (by gender), skills (including technical skills), organisational systems, potential interest and incentive motives to take on service provider roles
- **Technical diagnostics and financial analysis** for a set of existing or proposed water systems to examine their financial viability and the possibility for a private operator to generate reasonable revenue in managing them, and including consideration of how 'capital maintenance' costs (including replacement and rehabilitation) will be handled, and whether water tariffs will be charged on a



volumetric, or other, basis. Thorough analysis should be applied for schemes involving diesel powered pumps as these have high operating costs that may not be easily covered by user fees.

- **Scale:** Consider whether contracting would be for a single system or more than one system in a geographical area under the same contract
- Resolve questions around ownership of the relevant water systems, since the contracting authority is normally the asset owner
- **Resolve issues around multi-year planning and budgeting**, since entering into a multi-year agreement will be imperative, and hence the contracting authority also must have surety of funds over this period. Also address current public financial management bottlenecks (described further by Mellors, 2011) likely to hinder smooth partnership with the private sector.
- **Clarify the appropriate agency to act as the contract authority** (could be DNSA, SAS, DA or other agency), and develop a package of capacity building support around their role in tender preparation, reviewing, contract preparation and monitoring and oversight.
- **Consider how capacity building support could be provided to private sector or entrepreneurs (or NGOs)** to support their role in its initial stages. Incentives for participation may be required (Rural Water Supply Network (RWSN), 2011; p6), in terms of initial financing, potentially using output-based aid, which has been successful in the rural sector in other countries (Eg Vietnam) and approaches to risks management are required.
- **Link to private sector involvement in the urban sector.** Build from, and link with, efforts being undertaken in the urban sector through recent ADB funding focused on two district towns, in which public private partnerships are under consideration including consideration of the required policy and legal framework to support this direction.
- **Involvement of the microfinance sector.** Technical assistance to support the role of micro-finance institutions, for instance, development of financial products and services suitable for the rural sector that could support the role of private sector (or GMFs) in service provision as is done in Cambodia, Togo and Mali (Mehta, 2008).

## 4.3 SUPPORT AVAILABILITY OF PARTS AND SPECIALISED TECHNICAL ASSISTANCE

Improvements are needed in the area of supply chains for spare parts and specialised technical assistance for certain technologies. Lack of access to spare parts was found to be one of the determinants of functionality, and it is clear that dominantly centralised supply of parts in Dili is insufficient to ensure O&M can take place in a timely, cost-effective manner. In addition, lack of contracted specialised technical assistance for complex technologies risks failure of these technologies within short time-frames.

Addressing the supply-chain issues may require considering how capital investments are made. As Harvey (2011) asserts, there is a critical need to consider using local supply chains for capital investment in order to built viability of this local supply chain rather than by-pass it, as is the norm for both donor-funded and government-funded implementation projects. This is because profit on spare parts is minimal and is higher on providing initial components (Harvey, 2011), a point confirmed in interviewing a small business in Maliana District which was selling various system components (see Figure 10). In Timor-Leste



currently capital investment is undertaken through sourcing materials at least cost from Dili, Indonesia or overseas. A new model would see effort directed to strengthening local private sector in key districts and emphasis on donors and government purchasing capital materials, and spare parts, from these locally based companies, even if the costs were slightly higher. In this way it may be possible to gradually build a stronger supply chain.

Building a stronger supply chain for spare parts also requires concurrently working on demand for such parts and linking supply and demand. As GMFs develop O&M plans then linkage with appropriate local companies can be made. Hamel (2009b) recommends radio to advertise options and improve communications between companies and communities.

**Figure 10: Spare parts for sale in shop in Maliana (left, middle) and private sector company based in Dili offering pumps and pump maintenance services (right)**



The private sector may also be engaged in specific maintenance tasks relating to particular technologies and components (WSP, 2010c). For specialised technical assistance, it is recommended that national level contract between DNSA and one (or more) private sector companies is formed to maintain all (or a subset of) powered pumps, potentially with a graded contract towards training others locally (either local companies, SAS or associations of GMFs) to perform this function. Such components require specialised technical expertise which is not currently easily available in Timor-Leste, and without proper attention these components will fail and will represent a significant wasted investment when service levels deteriorate. This is in line with global thinking which promotes that “where feasible, the providers of hardware and equipment should be linked to long-term O&M, or hold asset maintenance contracts” (RWSN, 2011; p6). Box 5 provides the perspective of a private sector company in Dili on provision of such services.

Under the joint management model for larger systems, where SAS holds responsibility for larger components such as the mainline, there is a need to address how the required parts will be made available in the districts. Currently SAS maintains a warehouse with components for urban systems. These warehouses appear to be maintained in a relatively inefficient way. For SAS to provide responsive services to communities then either of two courses of action is needed:

- Include supply of rural system components to SAS district warehouses and significantly improve the efficiency of warehouse operation
- Contract private sector company(ies) in the district to stock the required parts, either through a contract that is managed centrally by DNSA, or individual contracts managed by the relevant SAS offices.

Box 5: A Timor-Leste private sector perspective on specialised maintenance services. Startec is a company with a current staff of 18 that serves donors and government, providing water system pump components imported from Germany (Grumfos electric pumps and Lorentz solar pumps). Startec offers 12 months warranty for materials supplied, which requires a higher price since fuel, labour and transport are needed to undertake any repair within that period. Startec has an interest in playing an on-going maintenance role, and also in playing a trainer or facilitator role to help others manage, operate and maintain their pumps.

Workforce planning in such companies is reported to be challenging since contracts are generally short- government generally only offers maximum 1 year contracts, and payment is also often slow which can create risks to cash-flow for the private sector. Lack of government funds for recurrent maintenance expenses means that large numbers of systems installed by this and other companies and donors now are not receiving appropriate maintenance.

Models to expand specialised maintenance services include the possibility to set up a base in different districts, potentially mentoring local NGO to start a business, focused first on servicing work and later potentially on supply, installation and spare parts. Another model is to have GMFs pay a monthly fee to be a 'member' and able to access free repairs as needed. In Uganda yet another effective model is mechanics associations, in that case, hand-pump mechanics (Nekesa, 2011).

Source: Interview with Startec; Nekesa, 2011

## 4.4 SET SUSTAINABILITY TARGETS AND INDICATORS

Monitoring is required of *services provided* rather than implementation of new systems, commonly measured as 'coverage'. There is a trend in the sector internationally towards monitoring the actual service users receive as opposed to the number of systems built (Lockwood and Smits, 2011) (see Box 6 for examples).

Timor-Leste has already started on this trajectory, initiating investment in the national database that includes functionality of systems, the water asset information system (SIBS). To ensure active use of the information generated and a drive towards better performance, Timor-Leste now needs to set specific targets for the sector, particularly with respect to functionality. Emphasis will also need to be placed on performance management in response to data collected, including adjustment of sector practices, policies and

Box 6: Mozambique is shifting from monitoring of implementation of new systems to monitoring the status of water points (functionality), frequency of maintenance, financial contributions and community participation in O&M.

Uganda has developed a set of eleven indicators for use nationally and at district level. Annual targets are set for each indicator. These indicators include the following seven indicators for rural water supply:

- **Access:** % of people within 1.5 km (rural) and 0.2 (urban) of an improved water source.
- **Functionality:** % of improved water sources that are functional at time of spot-check (rural) (Target of 86% for 2009/2010 and 90% for 2014/15)
- **Water quality:** % of water samples taken at the point of water collection and waste discharge point that comply with national standards
- **Quantity of water:** % increase in cumulative storage capacity of water for production
- **Management:** % of water point with actively functioning Water and Sanitation committees/boards
- **Gender:** % of water user committee/water boards with women holding key positions.
- **Water resources management compliance:** % of water abstraction and discharge permits complying with permit conditions

Source: MWE/DWD 2010; as cited in Lockwood & Smits, 2011



resource allocation. In addition, on-going support to SDF's with respect to data collection and DNSA capacity to undertake analysis and reporting from the SIBS system is needed.

## 4.5 STANDARDISE NORMS AND PROCEDURES

Standardisation of implementation is already being achieved through promulgation of the Rural Water Guidelines, recently updated in 2010. As mentioned earlier, capital investment in the sector has been fragmented, and a recent positive development is the Prime Minister's commitment that all agencies implementing water projects must follow the Rural Water Guidelines and standards for design and construction. Operationalising this commitment will require greater planning of human resource requirements (particularly in the face of increased sector investment) to ensure adequate oversight of design and construction processes. Further effort is needed to develop standard guidance for preparing O&M plans, for O&M training and follow-up to GMFs, as discussed earlier in Section 3.3.

## 4.6 PROVIDE DIRECT SUPPORT TO SERVICE PROVIDERS

There is widespread recognition of the need for direct support (sometimes termed 'post-construction support') to service providers, and a range of mechanisms and models have been developed internationally for this purpose (Lockwood and Smits, 2011; Smits et al., 2011). Direct support comprises a variety of functions shown in Box 7.

Box 7: Direct support includes the following functions:

- Monitoring: for instance of water quality, checking of accounts and system status
- Technical advice on O&M: this component is advice only, as distinct from contracting of mechanics or plumbers to carry out repairs which is considered part of O&M in service provision
- Administrative support: help in tariff setting or external auditing of accounts
- Organisational support: for example supporting community-based organizations to obtain status as a legal entity
- Conflict resolution
- Support in capital maintenance: Supporting identification of capital maintenance needs and potential sources of funding for such works
- Training and refresher courses: provided to water committees and their staff
- Provision of information
- Resource mobilization: to point service providers to funding sources or assist in accessing materials and spare parts directly

Source: Smits et al. (2011)

In Timor-Leste the current model is for SDFs to undertake many elements of this direct support role. The SDFs were not recruited for technical skills specifically, and hence these skills will need to be developed over time to allow them to play roles in technical advice and support to identifying capital maintenance needs. It is likely that complementing the SDF role with support to GMFs from an 'association of GMFs' might prove beneficial.

International research across ten countries investigated the costs of providing direct support to rural water service provision. The results indicate that an expenditure of US\$3



per person per year seems to be effective in lower middle income countries, and that those countries with expenditure below \$1 per person per year were considered too low to be effective (Smits, 2011). \$2 per person per year is considered an estimated minimum to promote adequate support to service providers, though this figure should be translated carefully taking into account individual contexts and costs (Fonseca, pers comm, 2012). In Timor-Leste, the current expenditure on direct support, through the salaries of CWSDOs and SDFs is in the order of \$0.44 per person per year<sup>12</sup>, which is significantly less than the norms suggested by the international research. It is recommended that realistic estimates of the required costs for CWSDOs and SDFs such as adequate fuel, transport and organisational infrastructure (eg computers etc.) should be considered, and that investment to support associations of GMFs is also made to complement government's role.

## 4.7 PROVIDE CAPACITY BUILDING TO SERVICE AUTHORITIES

Service authority roles are generally held at intermediate levels of government, and imply that the relevant agency is “responsible for guaranteeing access to services and being the asset owners” (Lockwood and Smits, 2011; p88). Service authority functions include planning and implementation, contracting, monitoring, direct support and capacity building or learning support. Accountability and oversight of service providers is required to improve service delivery and separating the role of service provider and service authority is a useful step towards ensuring this accountability. In Timor-Leste the service authority role currently lies mostly with DNSA/SAS, however in some instances the district administration is also involved.

In Timor-Leste planning is undertaken through a variety of mechanisms which are not coordinated and currently under flux. Mechanisms for suco development plans and local development plans are under revision, and in general appear to take place in parallel with SAS's planning processes. Beyond this, other priorities of unclear basis also appear to enter into the national budgeting process. Capacity building support to SAS around their O&M responsibilities is critically needed, including both mechanisms for SAS to play their role in joint management of larger systems, and also with regard to their involvement in systematic planning and budgeting of capital maintenance of all water systems. SAS also requires support to ensure Rural Water Guidelines (2010) are used to increase the quality of design and construction for all new systems that are planned and implemented.

On-going capacity building support is needed for SAS office staff, and particularly the SAS manager, CWSDO and SDF roles, towards their ability to support and improve the current community-based management service delivery model. In particular support for the collection and use of SIB data on the functioning of water systems and their GMFs is needed. Additional capacity building support would be needed context of trialling other service delivery models including tendering and contracting of private sector by SAS or DA or other agency. The focus would need to include efforts to address current public financial management challenges identified by Mellors (2011) such as delays in accessing funds at district level.

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<sup>12</sup> This calculation takes into account salaries, transport/fuel, community training costs and SIBs data collection costs.



## 4.8 PLAN FOR ASSET MANAGEMENT

Another starting point for developing improved O&M systems is asset management. Asset management is defined as: “*a means of managing infrastructure to minimize the cost of owning and operating it while delivering the service levels that customers desire*” (AMSA, 2002) and is common in the urban water sector.

Central to almost all approaches to asset management is an information system, inventory or register that captures existing assets and their condition. The SIBS system provides a starting point for such a system in Timor-Leste, however an asset management information system would require more detailed information than is currently collected and stored in SIBS. There are challenges to implement an asset inventory since SAS offices are under-equipped in terms of computing facilities and existing information such as ‘as-built’ plans are reported to be missing for many systems. Discussion within DNSA should be undertaken to consider the first viable steps towards better information collection about existing water systems and the status of their component assets. Without such information, basic planning processes for maintenance cannot be undertaken. In addition, an asset registration process can be used as a quality-control step in that only those systems that meet the standards in the Rural Water Guidelines and for which an ‘as-built’ design is made available can be registered.

Asset management interlinks three elements (Young, 1999):

- (i) the service level (or ‘performance standard’) that a user expects;
- (ii) life-cycle cost analysis concerning rehabilitation or replacement (to determine whether it is more cost-effective to undertake new works or to continue to maintain an existing asset through break repairs); and
- (iii) statistical modeling of the life of different system components (pipes etc.) using historical replacement and repair data to produce decay curves

Recent experience by Plan and BESIK indicate a tendency amongst communities and SAS to assume that broken components (and the water system more broadly) should always be replaced rather than be repaired. This perception is of significant risk to efficient asset management and one which may require time and effort to shift.

For rural systems, there is a scarcity of historical information about system component failure and costs in Timor-Leste, and hence another recommended starting point (also mentioned earlier in Section 3.3 and later in Section 4.8 below) is systematic collection of maintenance and cost information for a sample of adequately maintained systems over an extended period of time. In Timor-Leste currently only one study is available attempts to capture maintenance requirements and costs (Hamel, 2009b) and this study is limited in its scope and findings in this area.

## 4.9 UNDERTAKE PLANNING AND BUDGETING BASED ON LIFE-CYCLE COSTS

A re-orientation of sector investments towards adequate budgeting for recurrent costs and building the evidence base for what budgeting is needed. The global knowledge network for rural water supply notes that there are ‘big gaps in understanding the true costs of delivering services’ and points out the ‘misplaced investment’ in focusing only on the capital costs of new systems and community mobilisation during ‘implementation’ (RWSN,



2011). They report that “growing evidence indicates that the capital and recurrent costs of rural services lie in the ratio of 25:75” (RWSN, 2011). Recent research into life cycle costs of rural water systems through WASHCost identifies six types of costs (see Table 3) that need to be taken into account in planning and budgeting.

**Table 4: Life cycle cost components (adapted from Fonseca et al., 2011)**

Cost type		Description
Capital costs	<i>Capital Expenditure – Hardware and Software (CapEx)</i>	the capital invested in constructing fixed assets such as concrete structures, pumps and pipes, including (as ‘software’) one-off work with stakeholders prior to construction and technical supervision;
	<i>Operating /Minor Maintenance Expenditure (OpEx)</i>	expenditure on labour, fuel, chemicals, materials, regular purchases of bulk water and minor maintenance to keep the service running;
	<i>Capital Maintenance Expenditure (CapManEx)</i>	expenditure on asset renewal, replacement and rehabilitation, covering the work that goes beyond routine maintenance, to repair and replace equipment, in order to keep systems running;
	<i>Cost of capital (CoC)</i>	the cost of financing a program or project, taking into account loan repayments and the cost of tying up capital;
	<i>Expenditure on Direct Support (ExpDS)</i>	the expenditure on post-construction support activities direct to local-level stakeholders, users or user groups (such as training or capacity building);
	<i>Expenditure on Indirect Support (ExpIDS)</i>	the costs of macro-level support, planning and policy making (e.g. at department level).

In many countries, as in Timor-Leste, information to assess the life cycle costs is scarce, and hence the ability to plan and budget based on realistic cost information is lacking. A recommended next step is to initiate a study to systematically collect cost information across these categories for a sample of systems in Timor-Leste. Activity-based cost models that use generic resource inputs (time, travel, materials, energy) for each type of water system are a useful tool to build bottom-up estimates of actual O&M costs (Gibson and Matengu, 2010; as cited in Lockwood and Smits, 2011) and may be usefully employed within such a study. In addition, strengthening of financial data management in the sector more broadly at all levels would be beneficial and assist with transparency and freedom of access to information.

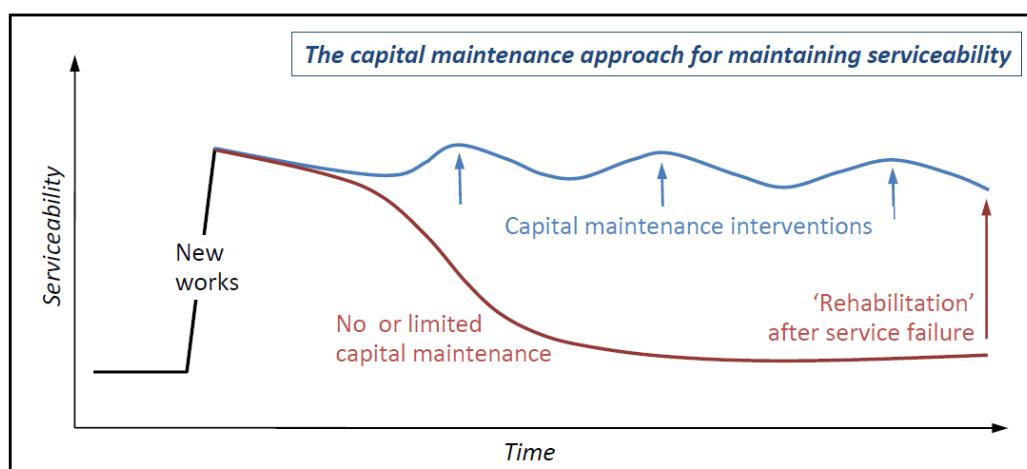
Consideration of all costs may mean that it is not realistic that users cover all costs. Even in the US, currently only 51% of capital maintenance costs are met from consumer tariffs (Person, 2007; as cited by Lockwood and Smits, 2011). Hence a further extension of any costing study is analysis of appropriate mechanisms for cost-sharing between users and government and interrogation as to whether the current tariff structure is adequate for sustaining services.



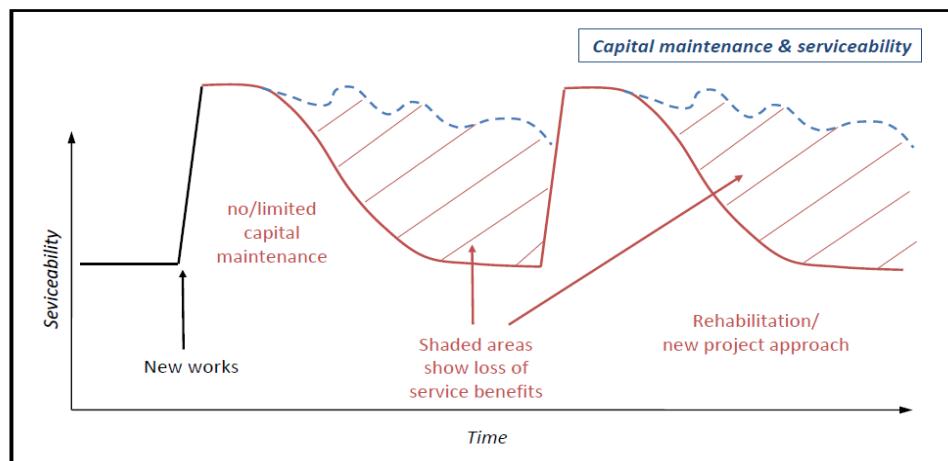
In Timor-Leste, both the predicted costs and the most appropriate cost-sharing arrangements are the least clear for capital maintenance (CapManEx). The WASHCost project shows CapManEx to be a minimum of 20% of capital investment annually, and for water utilities it is commonly 30-40% (Fonseca, pers. comm. 2012). Such expenditure is usually 'lumpy', occurring at irregular intervals and sometimes involving significant cost (Franceys, and Pezon, 2010). Since rural water systems are made up of multiple components each with different asset lives, and since there is no history of adequately attending to such maintenance needs in Timor-Leste, it makes prediction and modeling of such maintenance costs challenging. Failing to invest in capital maintenance will result in an inevitable decline in the service level, as shown in Figure 10 and Figure 11.

Responsibility for CapManEx normally lies with the asset owner, and hence the need to clarify ownership and to agree on cost-sharing arrangements between communities and government. In other countries, one mechanisms to address capital maintenance is through revolving loans with low interest rates for private sector operators (e.g. Burkina Faso; Lockwood and Smits, 2011) or legalised water user groups (eg. in Latin America).

**Figure 11: Capital maintenance interventions and how they maintain service levels**  
(Source: Franceys and Pezon, 2010)



**Figure 12: Delayed capital maintenance and resultant loss of service benefits**



As mentioned earlier in Section 4.5, costs for direct support in Timor-Leste are currently in vicinity of US\$0.44 per person per year based on SAS district and sub-district staff salaries, transport/fuel costs, community training and data collection, which is lower than the recommended \$2 per person per year (Fonseca, pers.com. 2012). Costs for indirect support (that is support provided at the national level of policy development and implementation) have not been estimated as part of this report but warrant further investigation as part of a life-cycle costing study in the future.

## 4.10 REGULATE RURAL SERVICES

In line with the idea that rural water services are a high-priority, valuable service that should therefore be delivered with a high degree of professionalism is the need to regulate service providers. Such regulation protects the interests of water users and is needed to ensure accountability for a certain level of service. Regulation is often part of the function of a service authority. Internationally one of the best examples is from West Africa, for example where a privatised monitoring and oversight function is used (Lockwood , pers. comm. 2011). Whilst implementation of a complete regulatory framework for rural water supply is a longer-term priority rather than an immediate need in Timor-Leste, there are elements of such a framework which can be considered now.

In professionalising community-based management and in bringing additional service provider models into the rural sector in Timor-Leste (such as associations of GMFs and public-private partnerships) will come the need to consider improved forms of accountability for service providers. Lessons cited from the sector internationally indicate that such regulation needs to avoid being highly punitive in fining rural operators for non-compliance as may be done in the urban sector (Lockwood and Smits, 2011). Rather, investing effort in clarifying and negotiating agreement between service provider and users on the expected service levels and establishing oversight to track performance against these by a service authority (potentially District Administration, or through SAS) will be a supportive step towards improving performance. The process of registration of GMFs with Suco council or subdistrict administration proposed in Section 4.1 would facilitate this direction. A final dimension of accountability is between service users and service providers. Suggestions made earlier in this report (see Section 3.3) consider this relationship with regards to GMFs and communities and how better accountability could be facilitated.

## 4.11 PROMOTE LEARNING AND SHARING

Whilst it may appear to be a luxury, investing in on-going efforts to support sector learning and sharing is a critical action that needs to be made at the national level and equally, driven concurrently by civil society.

BESIK, with its strong capacity building focus has offered significant support in this area over recent years, and it is important that DNSA also start to take leadership to ensure learning, sharing and exchange, and to pilot new approaches and disseminate the findings. Learning about what works and what doesn't within the context of Timor-Leste will be extremely important in looking to effectively translate other countries' experiences in the transition towards a service delivery approach to the Timor-Leste context.



## 5 TAKING ACTION

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The sections below summarise key recommendations made throughout this report, allocated to different lead actors in the sector. Further detail regarding many recommendations may be found in the relevant section earlier in the report.

### 5.1 GOVERNMENT OF TIMOR-LESTE

#### 5.1.1 Government leadership

Three key imperatives need leadership from within senior government towards ensuring sustainable rural water service delivery:

- (i) Rebalance the budget allocation for capital and recurrent costs and support medium-term expenditure planning
- (ii) Set sustainability indicators and targets for rural services
- (iii) Support alignment of all agencies to DNSA norms and procedures and improve coordination of the multiple capital investment planning processes

#### 5.1.2 Ministry of Infrastructure and DNSA

It is DNSA's role to lead improvements to current community-based service delivery model to better support GMFs ability to undertake O&M through actions such as (see Section 3.3 for more detail):

- (i) Extend CAP process to include O&M plans for every system/GMF, ensuring opportunity and support for women as well as men in key roles in O&M, update Rural Water Guidelines accordingly. Steps include an initial pilot to establish an effective approach followed by replication throughout existing and future GMFs.
- (ii) Develop financial O&M plans that predict costs, particularly for large systems, ensuring that on-going costs are considered during CAP planning
- (iii) Initiate a systematic research study to collect information on actual maintenance requirements and their related costs (for operation, minor maintenance and capital maintenance) for systems when they are being adequately maintained. IRC Water and Sanitation Centre's WASHCost methodology would be useful for this purpose.
- (iv) Offer practical mentoring and follow-up to O&M training to women and men
- (v) Provide incentives for well-performing GMFs
- (vi) Clarify the division between SAS and GMF roles in O&M, particularly concerning cost-sharing and asset ownership

Take action on SAS responsibilities for O&M in the current service delivery model. That is, for large systems where SAS has responsibility for O&M of mainlines and other common elements (see Section 3.3 for more detail):

- (i) Develop budgeting plans and advocate for adequate budget to perform SAS role
- (ii) Re-arrange personnel roles at district level to ensure capacity and skills are available in rural sector
- (iii) Set up an information system of relevant water systems to support O&M planning
- (iv) Decide on in-house warehouse or private sector contractor for spare parts
- (v) Clarify generalised approach to cost-sharing between SAS and community

In the light of this report, it is also important that DNSA consider the current draft National Water Policy and the implications of the recommendations for that policy.



Against the 11 building blocks that support a transition towards a service delivery approach, the following actions led by DNSA are a starting point:

Building block	Recommended key actions (see Sections 4.1- 4.11 for more detail)
1. Professionalise community management	<ul style="list-style-type: none"> <li>Develop process for registration of GMFs with Suco council or sub-district administration and proforma service agreements</li> <li>Proactively support GMFs to formalise agreement and properly recompense individuals for O&amp;M and other roles</li> <li>Continue to support GMFs to develop strong organisational processes including planning, budgeting, tariff collection, financial reporting and asset recording</li> </ul>
2. Promote alternative service provider models	<ul style="list-style-type: none"> <li>Trial new service delivery models including “associations of GMFs” provide certain O&amp;M functions with an economy of scale. For larger systems trial the following: <ul style="list-style-type: none"> <li>Community-based management with all O&amp;M functions contracted out to an NGO or private company</li> <li>Public-private partnership where government contracts a private operator under lease or build-own-operate/transfer</li> <li>Public-private partnership where government contracts an NGO for service provision under a lease agreement</li> </ul> </li> <li>Undertake preparatory work before trialling new models, including commissioning a market analysis study of private (and NGO) sector capacity, conducting technical and financial diagnostics on potential water systems for a trial, resolve asset ownership questions, clarify who should be the contracting agency etc.</li> </ul>
3. Support availability of parts and specialised technical assistance	<ul style="list-style-type: none"> <li>Procure from local suppliers for capital investments to support a viable supply chain that can also provide spare parts</li> <li>Contract one or more private sector companies at national level for specialised technical maintenance tasks on pumps</li> </ul>
4. Set sustainability targets and indicators	<ul style="list-style-type: none"> <li>Develop appropriate indicator(s) and target for sustainability or functionality and advocate their adoption</li> <li>Continue to support SIBS data collection and use in planning</li> </ul>
5. Standardise norms and procedures	<ul style="list-style-type: none"> <li>Continue to ensure alignment to and oversight of DNSA procedures</li> </ul>
6. Provide direct support to service providers	<ul style="list-style-type: none"> <li>Develop budget plan and advocate for increased investment for ‘direct support’ of service providers through SDF role and associations of GMFs</li> </ul>
7. Provide capacity building support to service authorities	<ul style="list-style-type: none"> <li>Ensure on-going capacity building of district SAS staff, particularly SAS manager, CWSDO, DTO and SDFs in multiple roles of O&amp;M provision for large systems, direct support role and contract management in new service provider models</li> </ul>
8. Plan for asset management	<ul style="list-style-type: none"> <li>Initiate a viable system to collect and maintain asset information, preferably electronically, potentially taking a staged approach</li> </ul>
9. Undertake planning and budgeting based on life-cycle costs	<ul style="list-style-type: none"> <li>Initiate a study to collect and assess cost information across all categories in life-cycle cost to underpin more accurate budgeting and forecasting</li> </ul>
10. Regulate rural services	<ul style="list-style-type: none"> <li>Support service agreements between GMFs and suco council/subdistrict administration and provide oversight of adherence to these agreements</li> </ul>
11. Promote learning and sharing	<ul style="list-style-type: none"> <li>Provide leadership on sectoral learning processes in moving towards a service delivery approach</li> </ul>



### 5.1.3 Other government agencies

Roles in rural water supply for Ministry of State Administration and Territorial Management (MSATM), District Administration and Sub-district Administration to support service delivery under the current, or future alternative service delivery models include:

- (i) Commit to using all DNSA norms and procedures in design and construction including the Rural Water Guidelines 2011 and associated CAP planning processes.
- (ii) Provide SAS oversight of all system design and construction
- (iii) Provide oversight of SAS's performance in joint management of larger rural systems where SAS has responsibility for mainline and other common elements
- (iv) Potentially play a role in contract management of private sector or NGO service operators in trials of these models

Ministry of Finance:

- (i) Address the imbalance between capital and recurrent cost allocations and the risks this presents from a fiscal policy perspective
- (ii) Ensure that planning and budgeting is based on realistic requirements (particularly with respect to recurrent budget needs, but also with respect to capital investments) developed by DNSA and the Ministry of Infrastructure are given appropriate consideration in the budgeting process.
- (iii) Consider the implications of the need for multi-year budgeting and planning that is imperative for securing DNSA's role in O&M and allowing for private sector involvement in the rural water sector
- (iv) Consider and provide guidance on the question of asset ownership for assets built with government funds

National development agency (ADN):

- (i) Ensure that DNSA Rural Water Guidelines are adhered to for all investments and support fiscal decentralisation with transparency and accountability measures
- (ii) Pending a larger future role with respect to public policy and investment policy, support a focus on recurrent budget allocations and provide policy guidance on private sector involvement in water as a public services, and public-private partnerships

## 5.2 DONORS

Donors need to:

- Advocate on core issues such as recurrent budget allocations and a focus on service delivery rather than infrastructure or implementation
- Support improvements to general public financial management and human resource management within DNSA and other agencies
- Facilitate trialling of private sector engagement as service providers and through contracts for specialised maintenance and technical assistance
- Consider new and different roles for NGOs, including in service provision and O&M rather than just in project implementation for new water systems



- Support DNSA in their critical role in leading transition towards a service delivery approach, including supporting the sector monitoring tool (SIBS), supporting SAS role and capacity in O&M and other roles noted above in Section 5.1.2 above.
- Support technical assistance aligned to existing donor initiatives in microfinance towards increased availability of financial products and services suitable for private sector or GMF's roles in service delivery.

## 5.3 INTERNATIONAL AND LOCAL NGOS

International NGOs and local NGOs have the opportunity to rethink their role in the sector to also shift away from an orientation focused on new systems and implementation to other roles to build capacity and services in O&M and on-going management. It is important that the concentration of technical and management skills in the NGO sector in Timor-Leste are used to support on-going service delivery. For example:

- local NGOs can potentially be contracted to perform service provision roles by either communities or government
- support the development of associations of GMFs, including such associations with a core focus on providing O&M functions.
- support to build and hold to account local private sector operators, for example through output-based aid approaches
- support viable supply chains through procuring any capital investments through local companies rather than by-passing this supply chain
- support constructive advocacy to improve voice and services

NGOs can also support improvements to the current community management model by piloting and supporting other recommendations of this report described in Section 3.3 including development of O&M plans as part of CAP processes and ensuring individuals responsible for O&M tasks are properly recompensed and held accountable for their roles.

## 5.4 PRIVATE SECTOR

The private sector needs to:

- Build capacity in terms of the technical skills necessary for supporting service delivery rather than only construction of water systems, which is the current dominating role
- Take on roles in service delivery through public-private partnerships or other similar arrangements, which will require strengthened organisational structures and systems to ensure good management and accountability. Such roles will require viable business plans and access to investment funding.
- Apply pressure to government with respect to multi-year planning and budgeting such that contracts can be developed of an appropriate term and clarity on asset ownership
- Examine opportunities available from micro-finance institutions to support roles in service delivery



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## ANNEX 1: KEY INFORMANTS

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AusAID: Jeff Prime (First Secretary), Faviula Monteiro (AusAID Program Officer), Jenny Asman (AusAID Adviser PFM)

Secretary of State for Electricity, Water & Urbanisation: Januário Pereira da Costa

DNSA: Sr João Pereira Jerónimo (Director) and DNSA senior management (Elias Pereia Moniz, Rui de Sousa, Gustavo da Cruz)

Ministry of State Administration: Miguel Carvalho (Head of Policy Directorate)

National Development Agency

Ministry of Finance: Daniel Wilde

ADB Project Management Unit Rural Roads: Jeanne Everett, Luis Bere Buti

NGOs: Dinesh Bajracharya (WaterAid), Alan Reade (Plan Timor-Leste),

Presentation and engagement at WASH Forum including with Red Cross and World Vision

Maliana: Visited Tapo system, Bobanaro sub-district administration, Maliana district administration

Atabae: Subdistrict administrator

Startec Enterprises: Kim Tchia

Shop selling spare parts in Maliana

Maubara GMF Federation



## ANNEX 2: SERVICE PROVIDER MODELS

A wide variety of different types of service providers are possible, and used internationally, for rural water service provision. The tables below cover the breadth of variations possible (Lockwood and Smits, 2011; p86) and their current applicability to Timor-Leste.

**Table 5: Variations of community-based management**

Model	Description	Applicability in Timor-Leste
Community-based management 1a	GMFs responsible for operation and minor maintenance of distribution system. SAS responsible for 'major repairs' and for certain components in large systems under joint management	Current model
Community-based management 1b	GMFs responsible for operation and minor maintenance, and GMFs out-source individual operational and/or maintenance functions to private individuals (for instance a community representative) or to small companies. SAS responsible for 'major repairs' and for certain components in large systems under joint management	Yes
Community based management 1c	GMFs responsible for operation and minor maintenance and Associations of GMFs provide certain O&M functions providing an economy of scale for these functions. SAS responsible for 'major repairs' and for certain components in large systems under joint management	Yes, should be explored- see Annex 3 for more detail
Community-based management 1d	All O&M functions out-sourced to private sector operator according to the following economies of scale: <ul style="list-style-type: none"> <li>• one local operator covering many similar systems; or</li> <li>• one local operator covering a geographic area containing a variety of system types</li> </ul> SAS responsible for 'major repairs' and for certain components in large systems under joint management	Yes, however more complex to implement

**Table 6: Variations of public sector management**

Model	Description	Applicability in Timor-Leste
Public sector operator 2a	Extension of district urban municipal entity (DSAS) to also manage nearby rural systems (whole system rather than just the components SAS is responsible for in joint management)	Not currently due to lack of human resources
Public sector operator 2b	Associations of municipal companies providing management services to rural communities	Not applicable
Public sector operator 2c	Local, regional or national public utilities providing management services to rural communities, including maintenance contracts	Not applicable as public utilities don't yet exist



**Table 7: Variations of private sector models**

Model	Description	Applicability in Timor-Leste
Private sector operators 3a	Public-Private-Partnerships (PPPs), with contracting authority (asset owner and responsible for ensuring services) contract a private sector operator to maintain and manage multi-village/larger systems under contract.	Yes, however will require significant preparatory work to trial- see Annex 3 for more detail.
Private sector operators 3b	Formal private operators working under license	Yes, however will require significant preparatory work to trial
Private sector operators 3c	Informal private sector providers: eg water kiosks etc.	Not currently part of the sector make-up.
Private sector operators 3d	NGOs and CBOs: Similar to PPPs (above) except that rather than a private operator taking on the contract, an NGO or CBO would take it on.	Yes, however will require significant preparatory work to trial- similar constraints to above.

**Table 8: Variations of self-supply models**

Model	Description	Applicability in Timor-Leste
Self supply 4a	Individual households	This is the norm in unserved areas, systematic support to O&M should be considered
Self supply 4b	Clusters of or neighbouring households	As above



## ANNEX 3: ANALYSIS OF SERVICE PROVIDER MODELS FOR TRIAL IN TIMOR-LESTE

The following two tables provide analysis of two proposed alternative service provider models for trial in Timor-Leste, (i) use of an association of GMFs, and (ii) public-private partnership with private sector (or NGO) operators for larger systems.

(i) <b>Community-based management supplemented by support in O&amp;M by associations of GMFs. The association of GMFs could be supported through either government funds, through 'membership' fees or payment for services or a combination of these</b>	
Type of water system to which this model is most suited	<ul style="list-style-type: none"> <li>For community-managed component of small and larger systems</li> <li>It is possible that DNSA could also contract the “association” to carry out their responsibilities under joint management for larger systems (e.g for mainline/pumps etc.)</li> </ul>
Main benefits	<ul style="list-style-type: none"> <li>An association can provide an economy of scale in some areas- for instance, in accessing spare parts, monitoring systems (eg circuit rider) for system maintenance needs, technical skills and services etc</li> <li>Provides back-up technical support to GMFs</li> <li>Potentially takes pressure off district SAS offices to provide support to GMFs</li> <li>Maintains philosophy of community leadership in managing their water systems</li> <li>GMFs and communities likely to have trust in an association in which they have voice and membership</li> <li>Associations can also provide an external body to support the social dimension of how GMFs function and resolving conflicts etc. (in a ‘direct support’ to service provider role).</li> </ul>
Main risks and disadvantages	<ul style="list-style-type: none"> <li>An association of GMFs is a community-based organisation which will require strong leadership, management skills and adequate technical skills and a secure funding stream to function well and professionally</li> <li>Potential need for separation between an ‘association’ focused on mutual support between GMFs and an association with an ‘advocacy’ focus, since each has implications for the kind of relationship with government that can be developed</li> </ul>
What would be needed at ‘enabling environment’ level?	<p>Ideally:</p> <ul style="list-style-type: none"> <li>Appropriate, supportive policy and legislation and institutional framework</li> </ul>
What would be needed at ‘service authority’ level?	<p>Ideally:</p> <ul style="list-style-type: none"> <li>If DNSA were to contribute to funding ‘associations’ to undertake a role in supporting service provision/O&amp;M then they would need the skills <ul style="list-style-type: none"> <li>to set up and manage such contracts with adequate specification</li> <li>provide clarity about who is responsible for major repairs and replacements</li> <li>have some oversight of the ‘associations’</li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>• If such associations were not supported by government funding, then they remain accountable to individual GMF members, and DNSA would be responsible for monitoring/oversight of both GMF and associations as service providers</li> <li>• Adequate investment by the service authority in capital replacement requirements (replacement and rehabilitation) and clarity about 'who pays' for this aspect of system maintenance.</li> </ul>
What would be needed at 'service provider' level?	<p>Ideally:</p> <ul style="list-style-type: none"> <li>• Ability of association to support O&amp;M functions such as: <ul style="list-style-type: none"> <li>◦ Access/supply of spare parts</li> <li>◦ Technical support and/or services for preventive and corrective maintenance tasks</li> <li>◦ Monitoring/circuit rider functions</li> </ul> </li> <li>• Financial sustainability to be ensured through any of: <ul style="list-style-type: none"> <li>◦ Support from government</li> <li>◦ Membership fees from member GMFs</li> <li>◦ Fee for services offered to GMFs/communities</li> <li>◦ Donor funding</li> </ul> </li> </ul>
Public financial management implications	If government were to consider supporting associations of GMFs in their roles, then both multi-year commitments and fiscal decentralisation would be required for this to happen effectively
Alignment with Go-DRTL strategic plan	Aligned with concept that rural communities are responsible for managing their water systems.
Implications for institutional arrangements for capital investment	Strong imperative that Rural Water Guidelines are followed, as otherwise management and O&M tasks will be costlier and more complex.
Supply-chain implications	An association could assist in providing some economy of scale to supply chains for common spare parts.
Potential to support gender equality and social inclusion	Associations should be encouraged to include quotas of female members and management positions and ensure equality of opportunity for any technical training of members.



<p><b>(ii) Public-Private-Partnerships (PPPs), with contracting authority (asset owner and responsible for ensuring services) contracts a private sector operator (or NGO) to maintain and manage multi-village/larger systems under contract.</b></p>	
Type of water system this model is most suited to	<ul style="list-style-type: none"> <li>• Larger systems (those under joint management or urban areas)</li> <li>• Systems with adequate water supply to potentially allow system expansion or upgrading to household connections</li> </ul>
Main benefits	<ul style="list-style-type: none"> <li>• Provides increased professionalism</li> <li>• Ensures commercial rigour is applied to O&amp;M- so operation, energy use, preventive maintenance, billing and revenue collection are undertaken and optimised</li> <li>• Possibility to improve services based on household demand (eg for private connections)</li> </ul>
Main risks and disadvantages	<ul style="list-style-type: none"> <li>• Availability of core skills in operators</li> <li>• Communities may be reticent to trust private sector</li> <li>• Requires financial sustainability</li> <li>• 1-3 year contracts may not provide enough time to recoup small investments, and larger investments (eg in rehabilitation or extension) are discouraged, hence longer contracts are needed (10-15 years) but imply risk if the operator is not effective</li> <li>• Demand in wet season often reduces, reducing financial viability</li> <li>• Lack of adequate regulation has been found to be the weakest link</li> </ul>
What would be needed at 'enabling environment' level?	<p>Ideally:</p> <ul style="list-style-type: none"> <li>• Appropriate, supportive policy and legislation and institutional framework</li> <li>• Development of financing instruments that enable a blend of commercial and grant funding (eg. guarantees, output-based aid, basket funds)</li> <li>• Mobilisation of financial institutions to develop a water sector business line</li> <li>• Development of regulatory tools and procedures (monitoring, performance indicators, model contracts) and information and awareness promotion for citizens</li> <li>• National level information collection for monitoring purposes (many countries now using mobile-2-web systems)</li> <li>• Deployment (and possibly initial or on-going financial support for) "business development services" (BDS) to offer support to new operators around core skills and functions, specialised maintenance etc.</li> </ul>
What would be needed at 'service authority' level?	<p>Ideally:</p> <ul style="list-style-type: none"> <li>• Ability of service authority to set up and manage the relevant contracts, which would likely require: <ul style="list-style-type: none"> <li>◦ Support or capacity building in skills to develop and manage clear, simple yet specific contracts (for instance, that clarify who is responsible for major repairs/replacements)</li> <li>◦ Support or capacity building in technical diagnostics, tendering support, bid evaluation, contract management, development of model business plans to share with prospective operators</li> </ul> </li> <li>• Adequate investment by the service authority in capital replacement requirements (replacement and rehabilitation) and clarity about 'who pays' for this aspect of system maintenance.</li> </ul>



	<ul style="list-style-type: none"> <li>Independent regulator (cannot be the contracting authority) to oversee performance and resolve disputes between operator and consumers or operator and contracting authority, with independence guaranteed through separate secure funding stream</li> </ul>
What would be needed at 'service provider' level?	<p>Ideally:</p> <ul style="list-style-type: none"> <li>Ability of private provider to operate and maintain system in a professional, transparent manner, which would likely require: <ul style="list-style-type: none"> <li>Support or capacity building in business development planning and financial accounting</li> <li>Support or capacity building in technical areas including preventive maintenance</li> </ul> </li> <li>Available financing options- potentially combining private equity from private operator or community with commercial loan and grant funding (with grant potentially based on performance eg output-based aid approach)</li> <li>Good communication with users with regard to service level expectations and making operational results public</li> <li>In most cases in other countries, the private operator is a local individual (most easily trusted), which would require willing/interested community members</li> </ul>
Public financial management implications	Multi-year planning and budgeting would need to be undertaken, allowing multi-year commitment and contract with private sector. Fiscal decentralisation will be important for contracting undertaken at the district level.
Alignment with Go-DRTL strategic plan	Well-aligned
Implications for institutional arrangements for capital investment	High quality construction would need to be guaranteed, as otherwise the private operator may be faced with unforeseen costs and challenges due to premature failure of components of the water system.
Potential to support gender equality and social inclusion	Would require support to women's involvement in enterprises, ensuring women have same opportunity to participate in a private sector initiative as men, potentially providing additional support to women-owned or managed companies, and ensuring both women and men could be employed by such companies.

