STUDY
ON
PUBLIC-PRIVATE PARTNERSHIP
IN WATER SECTOR
IN SUB-SAHARA AFRICA

November 2011

JAPAN INTERNATIONAL COOPERATION AGENCY

JAPAN ECONOMIC RESEARCH INSTITUTE INC.
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Executive Summary

This report is the final output of the study titled "Study on Public-Private Partnership in Water Sector in Sub-Sahara Africa" which has been led by JICA in a close collaboration with USAID, and the African Development Bank (AfDB).

The purpose of the Study is to find out ways in which USAID, AfDB and JICA can effectively support water PPP projects in Africa. To this end, the JICA Study Team (Study Team) analyzed the market potential of African water PPP including in-depth study of selected twelve countries and explore the possibility of creating the effective financial mechanism to address water PPP needs in Africa such as a private equity fund for African water sector.

In the first part of this report (sections 2.1-2.3), the PPP market potential of each of the twelve sample countries has been examined in terms of market size, investment environment and profitability. According to the collected data, the water market in Africa is a large market indeed in terms of its water demand and funding needs, but not always attractive due to restrictive investment environment and low estimated project profitability. Under such situation, international private operators are reluctant to make long-term investments by taking high risks (such as those under concession contracts, even in urban areas with large population) and finding opportunities only in management contracts with low risks in urban sector; while small domestic operators see opportunities only in small cities and rural areas where international operators are not attracted due to their small market size and the private sector involvement is more realistic through provision of technical assistance service and/or the lending from the private sector.

In the second half of this report (section 3), the possible support mechanisms for USAID, AfDB and JICA (three DFIs) to promote water PPP projects in Africa are discussed by segments (large projects in urban water sector and small projects in semi-urban water sector), with due consideration given to applicable funding schemes and the experiences of other donors and DFIs. It is suggested here that, given the current state of water infrastructure in Africa where capital investment are mostly financed by governments and donors through grants and/or concessional loans to public entities, the technical assistance to develop the environment to attract private funding and the project identification seem the realistic possible step forward to promote water PPP under the current situation. And to accomplish this, effective support mechanisms by three DFIs are recommended.

As the conclusion, the suggested actions for three DFIs to promote water PPP in African countries are recommended in the last section (section 4).

In the section 1.1, a demographic trend in Africa is introduced as well as the attempts by main donors to promote African water PPP.

In the sections 1.2 and 1.3, the detailed objectives of this study as well as the methodology to achieve them are laid out.

In the section 2.1, the current situation of water service in African countries are identified in term of a) access to safe drinking water and piped water, b) water service level, c) allocation of water resources and d) access to improved sanitation facilities and sewage system. As for access to safe drinking water and piped water, the percentage of urban population connected to a piped network in Sub-Sahara Africa is decreased from 50% to 39% according to AICD, due to rapid population growth and shortfall and delay of water supply development. Water service level is measured by several parameters such as continuity of service, NRW ratio, collection ratio of water bill, operating cost coverage ratio and number of staff per 1000 connections. Those parameters do not show necessarily satisfactory level of service. In terms of allocation of water resources, the agricultural sector accounts for about 63% of total consumption. The shortage of potable water may be the result of the current usage and failure of policy makers to re-allocate it to domestic sector. As for access to improved sanitation facilities and sewerage system, sewerage service is provided only in limited urban areas, though available data is limited.

In the section 2.2, due to lack of raw data, the funding gap (i.e. the difference between required amount of public investment and available public investment) for 53 African countries is estimated by running regression based on the secondary data available, namely the Africa Infrastructure Country Diagnostic (AICD). The required financing amounts to around 2.6 billion USD per year, which shows a large market potential for African water PPP.

In the section 2.3, the reasons for the limited number of PPP projects despite the high funding demand in African water sector are examined, including a) lack of political will, b) inadequate investment environment, c) low levels of tariffs (and thus low profitability) and d) low collection rate. Lessons are also drawn from the past experience with some suggestions for sustainable PPP project implementation in Africa, including the availability of a) strong domestic banking sector as a source of medium- to long-term finance without exchange risks, b) domestic credit guarantee mechanism as a credit enhancement measure and c) large-scale

projects to ensure benefit from the lower transaction costs and economies of scale.

In the section 3.1, the overview of financing to water sector in Africa is discussed. In this area, public funding source is still dominant in most countries, except for few cases for larger transactions in urban water sector in wealthy countries such as Morocco and South Africa, and one BOT project fully covered by ECAs in Sudan.

While the section 3.1 covers the overall water sector, the section 3.2 focuses on the large transaction in urban water sector. The bottlenecks including lack of enabling environment, political climate, pioneer projects (success stories), capacity of water utilities, and debt mobilization / credit enhancement measures, and existing donor facilities to cope with these bottlenecks are examined. For this segment, the suggested short-term supports are: (a) creating new enabling environment for water PPP and producing good practice of funding on an individual project basis, including (i) investment grade rating, (ii) stable foreign exchange rate, (iii) strong local banking sector. For the medium-term, based on these supports, in the medium term and long term, the concessional financial support by donors and a permanent funding mechanism, such as a private equity fund and the Philippines-typed revolving fund etc., at the regional and/or country level, can be considered, respectively. In addition to that,(b) the technical assistance for (i) water sector reform policy, strategy, and regulation, (ii) awareness raising programs, (iii) preparation and implementation of social connection programs, (iv) capacity development of related governmental organizations to realize PPP projects, (v) capacity enhancement of public water utilities, (vi) credit enhancement, and (vii) financial structuring and legal framework, (c) Project screening criteria for deal selection and risk mitigation consideration are suggested.

The section 3.3 focuses on funding for the small transactions in semi-urban water sector. The bottlenecks are high transaction costs due to the smaller transaction size, in addition to the items identified in the section 3.2 For this segment, the short-term supports are considered (a) from the viewpoints including (i) stability of institutional framework, (ii) domestic long-term financial market, (iii) disclosure and reliability of financial information, (iv) structuring of financial scheme for small sized projects, and (v) monitoring and safeguard, and by (b) search for potential transaction and support for structuring bankable transaction based on the deal selection and risk mitigation considerations as mentioned in 3.2, including (i) bundling of several projects through the use of master trust, (ii) blending of private funds with concessional loans and grants, and (iii) pooled finance and revolving facility, (iv) combination of output-based-aid (OBA) with micro-finance, (v) NGO-initiated project formulation: In the

medium term and long term, the concessional financial support by donors and a permanent funding mechanism, such as a private equity fund and the Philippines-typed revolving fund etc., at the regional and/or country level, can be considered, respectively (NOTE: These funding mechanism can be realized in the short-term if the feasibility could be confirmed). In addition to that, besides the technical assistance suggested in 3.2, (b) the technical assistance for (i) capacity development of related governmental organizations to realize PPP projects, (ii) capacity development of small public water utilities, (iii) preparation and implementation of social connection programs, (iv) credit enhancement, (v) financial structuring and legal framework and (c) introduction of standardize documentation and procedures can be considered.

Taking these proposed actions, three DFIs should make progresses and achievements step by step in short-, medium-, long-term, by identifying financing opportunities and exploring wider range of options of creating funding mechanism such as a private equity fund and the Philippines typed revolving fund etc. As for USAID-AfDB and JICA-PSIF collaboration, three DFIs should specify the target countries and the project to be implemented together at the first stage, then, subsequently design the basic framework and examine its financial and legal structure, and conduct the feasibility study step by step.

Finally, to further promote private sector participation in the African water sector, it is highly recommended that the continuous engagement of water sector reform and continuous capacity building efforts are essential for both the African developing countries and DFIs. DFIs and donors' support for financial structuring for private sector participation is also essential.

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Abbreviations

ABH	Agence du Bassin Hydraulique (Hydraulic Basin Agency)
AdeM	Águas de Mozambique (Mozambique Water)
AdeP	Águas de Portugal (Portugal Water)
AfDB	African Development Bank
AFD	Agence Française de Développement
AIAS	Administração de Infra-estruturas de Abastecimento de Água e Saneamento (Water and Sanitation Infrastructures Administration, Mozambique)
AICD	Africa Infrastructure Country Diagnostics
AMENDIS	Société Amendis (Morocco)
AMENDIS-TA	Amendis Tanger (Morocco)
AMENDIS-TE	Amendis Tetouan (Morocco)
ANDEA	Autorité Nationale de l'Eau et de l'Assainissement (National Authority for Water and Sanitation, Madagascar)
ANGT	Agence Nationale des Grands Travaux (National Agency of Major Works, Gabon)
APC	Area Performance Contract (Uganda)
APIP	Agence de Promotion des Investissements Privés (Private Investment Promotion Agency, Gabon)
APIX	Agence National de Promotion et de Investments du Senegal (Senegal Investment Promotion Agency)
ARA - Sul	Administração Regional de Águas do Sul (Regional Water Administration - South, Mozambique)
ASUFOR	Associations d'usagers de forages ruraux (Association of Users of Rural Boreholes, Senegal)
AVRL	Aqua Vitens Rand Water Ltd
AWSB	Athi Water Services Board (Kenya)
BOAD	Banque Ouest Africaine de Développment (West Africa Development Bank)
BOT	Build-Operate-Transfer
CAGR	Compound Average Growth Rate
CERD	Centre D'etudes Et De Recherche de Djibouti (Centre of Studies and Research in Djibouti)
CFAF	CFA Franc (Currency unit, =FCFA)
CFAF	Communauté Financière Africaine Franc (African Financial Community Franc)
CoJ	City of Johannesburg
CPI	Consumer Price Index
CRA	Conselho de Regulação do Abastecimento de Água (Water Regulatory Council , Mozambique)

CSLP	Cadre Stratégique de Lutte contre la Pauvreté (Strategic Framework for the Fight against Poverty, Djibouti)
CWSA	Community Water and Sanitation Agency (Ghana)
DAs	District Assemblies (Ghana)
DBSA	Development Bank of Southern Africa
DEA	Direction de l'Eau et l'Assainissement, Ministère de l'Intérieur (Direction of Water and Sanitation, Ministry of Interior, Morocco)
DEM	Direction de l'Exploitation et de la Maintenance, Ministère de l'Habitat, de la Construction et de l'Hydraulique (Direction of Operation and Maintenance, Ministry of the Habitat, the Construction and the hydraulics, Senegal)
DEPA	Direction de l'Eau Potable et de l'Assainissement (Directorate of Drinking Water and Sanitation, Madagascar)
DGPRE	Direction de la Gestion et de la Planification des Ressources en Eau (Direction of the Management and the Planning of Water Resources, Senegal)
DHR	Direction de l'Hydraulique Rurale, Ministère de l'Habitat, de la Construction et de l'Hydraulique (Direction of Rural Hydraulic, Ministry of the Habitat, the Construction and the hydraulics, Senegal)
DHU	Direction de l'Hydraulique Urbaine, Ministère de l'Habitat de la Construction et de l'Hydraulique (Direction of Urban Hydraulic, Ministry of the Habitat, the Construction and the hydraulics, Senegal)
DMF	Delegated Management Framework
DRSC	Direction des Régies et Services Concédes, Ministère de l'Intérieur (Direction of Municipal Utilities and Concession Services, Ministry of Interior, Morocco)
DSA	Debt-Sustainability Analysis
DWA	Department of Water Affairs (South Africa)
DWD	Directorate of Water Development (Uganda)
DWSTs	District Water and Sanitation Teams (Ghana)
EBITA	Earnings Before Interest, Taxes, Depreciation and Amortization
EGP	Egyptian Pound (Currency unit)
ES grant	Equity share grant
FCFA	Franc de la Communauté Financière Africaine (Currency unit, =CFAF)
FIPAG	Fundo de Investimento e Património do Abastecimento de Água (Water Supply Investment and Asset Fund, Asset holding company in Mozambique)
FSN	Fonds de solidarité nationale (National Solidarity Fund, Tunisia)
GDB	Gabon Development Bank
GHc	Ghana Cedi (Currency unit)
GIRE	Gestion Intégrée des Ressources en Eau (Integrated Water Resources Management, Madagascar)

GNI	Gross National Income
GoD	Government of Djibouti
GoG	Government of Ghana
GoU	Government of Uganda
GPRS	Ghana Growth and Poverty Reduction Strategy
GPRS	Growth and Poverty Reduction Strategy (Ghana)
GWCL	Ghana Water Company Limited
GWI	Global Water Intelligence
GWSC	Ghana Water and Sewerage Corporation
HCWW	Holding Company for Water and Wastewater (Egypt)
IBNET	International Benchmarking Network for Water and Sanitation Utilities
IDAMC	Internally Delegated Area Management Contract
IMF	International Monetary Fund
INDS	National Initiative for Social Development (Djibouti)
IWRM	Integrated Water Resource Management (Egypt)
JICA	Japan International Cooperation Agency
JIRAMA	Jiro sy Rano Malagasy (National Water and Electricity Company, Magdagascar)
JMP	Joint Monitoring Program
Jowam	Johannesburg Water Management Company
JW	Johannesburg Water
KRIP	Kampala Revenue Improvement Project (Uganda)
LWC	Lagos Water Corporation
Lydec	Société Lyonnaise des Eaux de Casablanca
M&E	Monitoring and Evaluation
MAD	Dilham Marocaine (Moroccan Dilham, Currency unit)
MAEM-RH	Ministere de l'Agriculture, de l'Elevage et de la Mer, Charge des Ressources Hydrauliques (Ministry of Agriculture, Livestock and the Sea in charge of Water Resources, Djibouti)
MAP	Madagascar Action Plan
MDGs	Millennium Development Goals

MEM	Ministry of Energy and Mining (Madagascar)
MEMEE	Ministère de l'Energie, des Mines, de l'Eau et de l'Environnment (Ministry of the energy, the Mines, water and the Environment, Morocco)
MEWR	Ministère de L'Énergie et des Ressources Hydrauliques (Ministry of Energy and Water Resources, Gabon)
MFEP	Ministry of Finance and Economic Planning (Ghana)
MHUUD	Ministry of Housing, Utilities, and Urban Development (Egypt)
MLGRDE	Ministry of Local Government, Rural Development and Environment (Ghana)
MPWIC	Ministère des Travaux Publics, des Infrastructures et de la Construction (Ministry of Public Works, Infrastructure and Construction, Gabon)
MWE	Ministry of Water and Environment (Uganda)
MWRWH	Ministry of Water Resources, Works and Housing (Ghana)
NCWSC	Nairobi City Water and Sewerage Company
NCWSP	National Community Water Supply and Sanitation Programme (Ghana)
NDPC	National Development Planning Commission (Ghana)
NEPAD	New Partnership for Africa's Development
NGO	Non Governmental Organization
NIPA	National Investment Promotion Agency (Djibouti)
NRW	Non Revenue Water
NWRP	National Water Resource Plan
NWSC	National Water & Sewerage Corporation (Uganda)
O&M	Operation and Maintenance
OBC	Outline Business Case
OCCR	Operating cost coverage ratio
ONAS	Office National de l'Assainissement du Sénégal (Senegal National Office of Sanitation)
	Office National de l'Assainissement (National Sanitation Utility, Tunisia)
ONEA	Office national de l'eau et de l'assainissement (National water agency in Burkina Faso)
ONEAD	Office National de l'eau et de l'assainissement de Djibouti (National Water and Sanitation Authority of Djibouti)
ONED	Office national des eaux de Djibouti (National Water Authority of Djibouti)
ONEP	Ofice National de l'Eau Potable (National Office of Potable Water, Morocco)

OSUL	Ondeo Services Uganda Limited
PAGER	Programme National d'Alimentation en Eau Potable en Milieu Rural (National Program of Water Supply in Rural Area, Morocco)
PARP(A)	Plano de Acção para a Redução da Pobreza (Absoluta) ((Absolute) Poverty Reduction Action Plan, Mozambique)
PEPAM	Programme d'Eau Potable et d'Assainissement du Millenaire (National Water and Sanitation Program of the Millenium, Senegal)
PESA-ASR	Plano Estratégico de Água e Saneamento Rural(Rural Water and Sanitation Strategic Plan, Mozambique)
PFMA	Public Finance Management Act (South Africa)
PGE	Politique Générale de l'Etat (State's General Policy, Madagascar)
PLT	Projet Sectrial Eau à Long Term (Long Term Water Sector Project, Senegal)
PNAEPA	Programme National d'Accès à l'Eau Potable et l'Assainissement (National Programme for Safe Water Supply and Sanitation, Madagascar)
PPIAF	Public-Private Infrastructure Advisory Facility
PPP	Public Private Partnerships
PRSP	Poverty Reduction Strategy Papers
PSE	Projet Sectrial Eau (Water Sector Project)
PSNA	Politique et Strategie Nationale de l'Assainissement (National Sanitation Policy, Madagascar)
PURC	Public Utilities Regulatory Commission (Ghana)
PUSRP	Privatization and Utility Sector Reform Project (Uganda)
REDAL	Société Redal (Morocco)
Régie	Municipal Utilities (Morocco)
SABS	South African Bureau of Standard
SAMVA	Service Autonome de Maintenance de la Ville d'Antananarivo (Autonomous Antananarivo Municipal Maintenance Service, Madagascar)
SAUR	Société d'Aménagement Urbain et Rural (Urban and Rural Development Company)
SDE	Sénégalaise des Eaux (Senegal Water)
SEEE	Secrétariat d'Etat chargé de l'Eau et de l'Environnment (State Secretariat in Charge of Water and Environment, Morocco)
SEEG	Société d'Electricité et d'Eaux du Gabon (Gabonese Electricity and Water Company)
SEEN	Société d'Exploitation des Eaux de Niger
SEOER	Société des Eaux d'Oum Er'Rbia (Oum Er'Rbia Water Company, Morocco)

SIP	Strategic Investment Plan
SMS	Short Message Service
SNDE	National Water Master Plan (Djibouti)
SONEDE	Société Nationale d'Exploitation et de Distribution des Eaux (National company for water operation and distribution, Tunisia)
SONEES	Société Nationale d'Exploitation des Eaux du Sénégal (Senegal Water Utility Company)
SONES	Société Nationale des Eaux du Sénégal (Senegal National Water Company)
SWAp	Sector-Wide approach
TCTA	Trans-Caledon Tunnel Authority (South Africa)
TD	Tunisian Dinar (Currenct unit)
UFW	Unaccounted For Water
UN-HABITAT	United Nations Human Settlements Programme
USAID	United States Agency for International Development
USE	Uganda's Securities Exchange
VAT	Value Added Tax
VIP	Ventilated Improved Pit latrine
W & WW	Water and Waste Water
WASH	Water, Sanitation and Hygiene
WATSAN	Water and Sanitation
WB	World Bank
WHO	World health Organisation
WOPs	Water Operators Partnerships
WRC	Water Resources Commission (Ghana)
WSS	Water Supply and Sanitation
WSUP	Water Supply and Sanitation for the Urban Poor
WTPs	Water Treatment Plants
WWTPs	Waste Water Treatment Plants
ZAR	South African Rand (Currenct unit)

1. Introduction

1.1 Background

Recently, Africa has been attracting strong attention economically not only from developed society but also from emerging countries such as China and India. They are interested in abundant natural resources such as oil, diamonds, gold, iron, cobalt, uranium, and copper. Construction of necessary infrastructure in order to explore and develop these resources, including power plants and roads, in itself seems be very fascinating business for ambitious investors.

Africa is said to be the last emerging markets. According to the latest projections from the United Nations, the global population will cross 10 billion by 2085. The bulk of the population growth is expected to come from the developing world. Among them Africa's population will rise from 1 billion in 2010 to 3.6 billion in 2100. The continent has great potentiality to become promising consumer markets in the near future. According to the report by African Development Bank (AfDB)[1], 34.4% of Africans are now in the middle class defined as having between $2 and $20 to spend a day. A decade ago, the percentage was only about 27.2%. This change has occurred in a period of fast population growth among low-income families.

However the report added that 60.8% of the supposed middle class have just $2 to $4 per day. It explains that most of the middle class in Africa are still floating that remains largely vulnerable to slipping back into poverty in the event of some exogenous shocks. Furthermore, geographical variations persist. In Sub Saharan Africa except some countries such as Botswana, Ghana, Kenya and South Africa, percentage of the middle class as defined above is less than 20%.

Great potential market for the infrastructure development means the current situation of social and economic infrastructure still remains in low level and requires a lot of efforts for development. This is especially true with water sector. In Sub-Saharan Africa, improvement in access to water supply services is one of the urgent issues, as water supply rate remains low and the percentage of water supply by pipes in urban area is less than 50%.

To improve the lives of African people and to enhance proper water management in Africa, Japan and the United States have been joining forces through multilateral cooperation. At the

[1] http://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/The%20Middle%20of%20the%20Pyramid_The%20Middle%20of%20the%20Pyramid.pdf

World Summit in Johannesburg September 2002, for instance, the two countries had launched the “Clean Water for People Initiative”, a joint endeavor to provide safe water and sanitation to the world’s poor, to improve watershed management, and to increase the productivity of water. And at the Evian Summit in June 2003, both countries as the members of G8 had adopted "Water G8 Action Plan" in which they agreed 1) promotion of PPP (Public Private Partnerships), 2) application of tools for development assistance for water and sanitation projects, 3) encouragement of financing irrigation practices, and 4) support for building local water management systems in rural areas, and water and sewage facilities in urban areas.

As well, Japan has been assisting African countries through bilateral cooperation: Japan International Cooperation Agency (JICA) has been providing grant aid to develop groundwater, water treatment plants and distribution facilities as well as technical assistance (including capacity development) for urban and rural water supply management. One of these efforts of JICA is illustrated by the commitment at the Tokyo International Conference on African Development (TICAD) IV held in Yokohama, Japan in 2008, which includes (1) grant and technical assistance out of 30 billion Japanese yen on water and sanitation, (2) provision of safe drinking water to 6.5 million people, and (3) capacity building of 5,000 water managers/users.

Based on the agreement of G8 Gleneagles Summit 2005, development partners established Infrastructure Consortium for Africa (ICA) to promote infrastructure development including water, transportation, energy and ICT. ICA conducted Africa Infrastructure Country Diagnostic (AICD) and published the study report in November 2009. AfDB also established the “Africa Water Facility” in 2005 and has been supporting the water sector development by providing grant assistance.

However, the necessity of improving water supply services of the region remains large, and mobilization of private funds is thought to be essential to improve the water sector services in Africa.

Although there have been private consignments (mainly management contracts) in 23 African countries since early 1990, those private consignments are not very active recently. Countries which started new private consignments in recent years are limited to Ivory Coast, Mauritius[2], and Mozambique. This would be thought due to the following problems inherent to private consignment in the water sector services in Africa;

- Water business needs long term for cost recovery due to low income level in African regions.

[2] World Bank PPP Infrastructure Database

It also subjects to foreign currency risks because water revenues are generated in local currency.

- Origination of commercially viable projects is not sufficient compared to the market potential.
- Access to mid-long term financing from domestic financial institutions and capital market is limited, despite the commercial viabilities of projects. Governments in African countries are reluctant to provide guarantees and World Bank is not willing to provide guarantee to private water projects. (Note: There is a project bond guarantee scheme by IFC in South Africa.)
- Contract fulfillments are under high risk for being revoked. AICD report of 2008 points out that 25 percent of all projects have been cancelled in the past.

In spite of the problems mentioned above, there seems to be large financial needs for improvement in the water sector. In order to fill the funding gap, development of funding mechanism, by which PPP projects in the water sector can have access to finance with appropriate period and condition, is essential. Development financial institutions (DFIs) have set up "Private Infrastructure Development Group" (PIDG) and "Emerging Africa Infrastructure Fund (EAIF)" to promote private investment in infrastructure including the water sector. However, private finance mobilization is still limited.

PPP project typically takes one of following forms such as management contract, lease, affermage and concession. But, in developing countries in Africa, the word of PPP should cover wider scope and definition because some people in the public sector even have not yet properly understood how they should and could use private sector resources to improve their utility businesses. Under this condition, the simple introduction of private money into public business could be categorized as the primary form of PPP so that they could come to realize the merit and the necessity of PPP based on their real experiences of private involvement.

Under these circumstances, JICA pursued possibilities to set up a new funding mechanism for water projects, in cooperation with USAID which has experiences in revolving funds for the water sector in Philippine together with JICA, and AfDB which has extensive knowledges and experiences of African countries.

1.2 Objectives of the study

In this study, the Study Team covered both Sub-Saharan and North African countries and

conducted the following tasks;

- Assess the current situation of the water sector of countries in these regions and needs for private investments as well as the institutional, legal, regulatory and corporate governance barriers that block private investment in these countries.
- Identify the capacity and willingness of the private financial institutions and the local currency debt capital markets to provide financial support for public/private water projects.
- Find out and develop basic directions and concepts of the financial support scheme for water PPP projects.

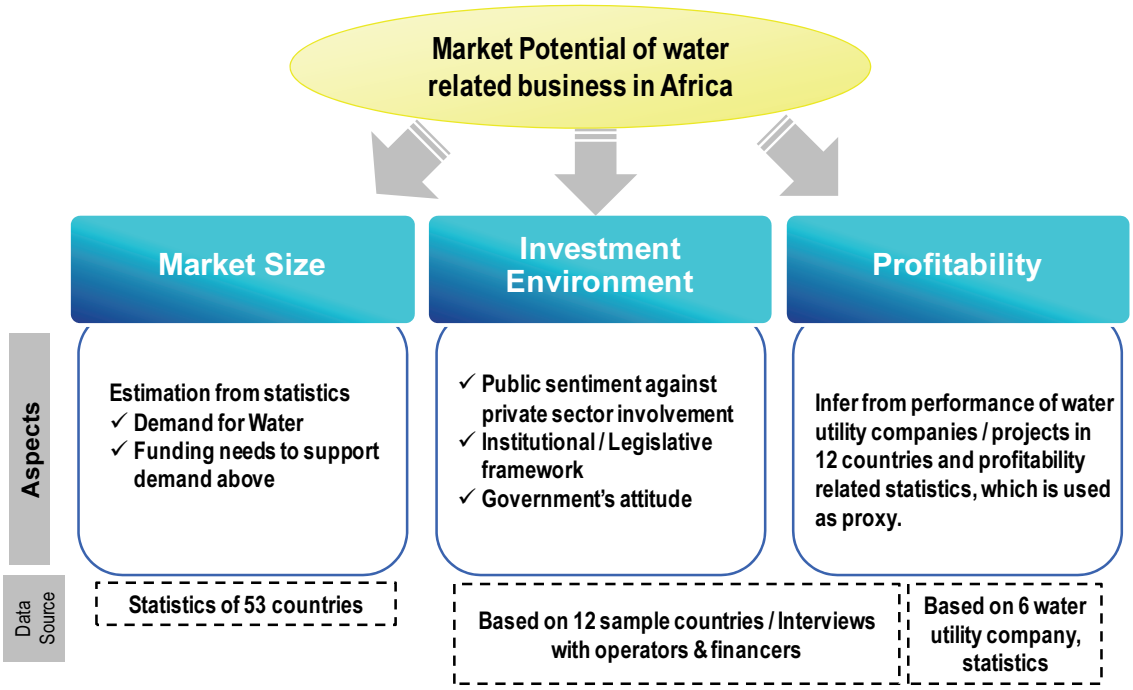
1.3 Methodology of the study

The report is consisted of mainly two parts. For the first part, the market potential is examined. In order to examine the market potential, three aspects are focused: the potential market size, the investment environment and the profitability.

- Market size: it is examined through the current situation of water service in Africa including the water demand and the funding needs to deliver the service for this demand. For this sake, the sections of 2.1 and 2.2 discuss the water demand and the funding needs to deliver the services for the water demand, respectively. For the current situation of water service, access, water service level, allocation of water resources are examined. For the funding needs, the market size and its growth are firstly looked at. In order to see the potential for private investment out of this market size, the funding gap is estimated by the regression analysis based on 12 countries where the data are available.
- Investment environment: it is highly possible that country specifics and the situations greatly differ among countries. Therefore, 12 selected countries are examined in terms of the change in the contracts, which could positively and negatively affect a project, and the overall investment environment toward PPP including government's attitude in addition to the interviews with the stakeholders including potential investors.
- Profitability: it differs depending on the scheme in the contract, thus project-specific. Therefore, in order to grasp the rough picture of the water business in Africa, some sample water utility companies and profitability related statistics of PPP projects in 12 countries are examined in addition to the interviews.

The approach above is illustrated in the following diagram.

Figure 1 : Approach to examine market potential of water sector in Africa



The second part of the report, based on these market potential, the possible interventions are discussed in Section 3. Then the Study developed the direction and concepts of funding mechanism for water PPP projects, based on the identified needs for the private investments in water sector as follows;

- Review the past trends in financing of the projects, involvements of donors and DFIs, and existing comparable funding scheme.
- Develop the concepts of funding mechanism for PPP projects in water sector, based on the comparable funding scheme and actual funding needs identified in the previous section by three DFIs (USAID, AfDB and JICA).

As the conclusion, the suggested actions for three DFIs to promote water PPP in African countries are recommended in the last section (section 4).

2. Market potential of water PPP in African countries

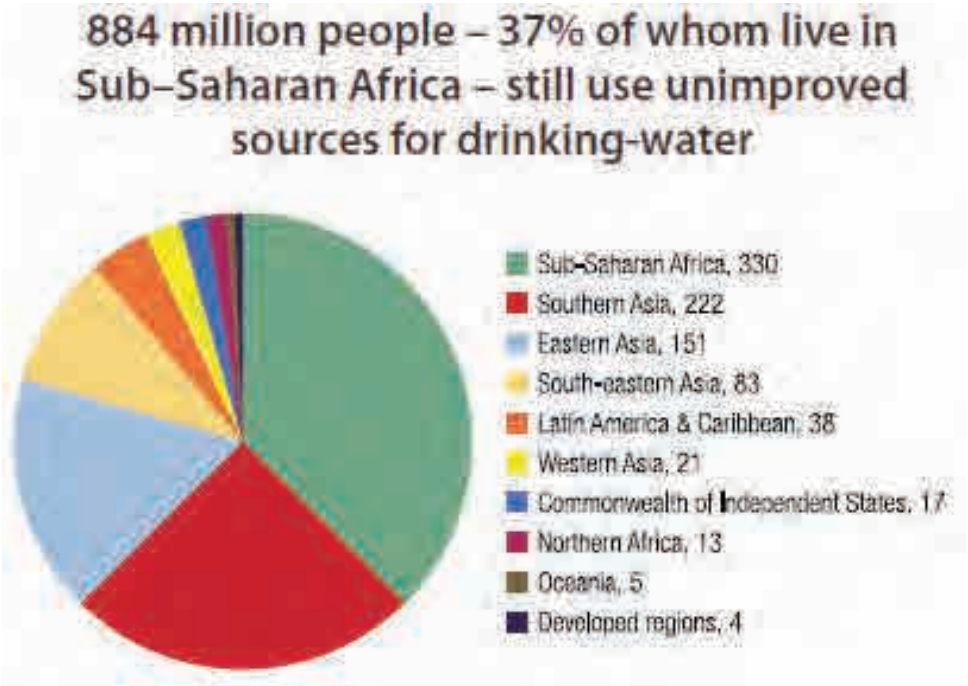
2.1. Current situation of water service in African countries

2.1.1 Access to safe drinking water and piped water

There are substantial needs for water infrastructure in Sub-Sahara Africa region. Although the use of improved sources of drinking water is high globally, Sub-Saharan Africa region is lagging behind in progress towards the MDG target with only 60% of the population using improved sources of drinking-water despite an increase of 11 percentage points since 1990.

According to WHO-UNICEF Joint Monitoring Program (JMP), 330 million people in the region lack access to clean drinking water and it accounts for over a third of total number in the world. In contrast, there are 13 million people who lack access to clean drinking water in North African Countries. (Figure 2)

Figure 2: Regional distribution of the 884 million people not using improved drinking water source in 2008, population (million)



Source: WHO/UNICEF Database (2008 data)

As shown in Figure 3, the countries with under 50% of access to safe drinking water are Somalia, Ethiopia, Madagascar, Democratic Republic of the Congo, Mozambique, Niger, Mauritania and Sierra Leone. On the other hand, Mauritius, Egypt, Botswana, Comoros, Tunisia, Gambia, Namibia, and South Africa show high access ratio, more than 90%.

Figure 3 : Access to Safe Drinking Water in Africa

Access Rate to Safe Drinking Water	Country
More than 89%	Mauritius (99%), Egypt (99%), Botswana (95%), Comoros (95%), Tunisia (94%), Gambia (92%), Namibia (92%), Djibouti (92%) South Africa (91%)
70%-89%	São Tomé and Príncipe (89%), Gabon (87%), Lesotho (85%), Cape Verde (84%), Algeria (83%), Zimbabwe (82%), Ghana (82%), Morocco (81%), Malawi (80%), Cote d'Ivoire (80%), Burkina Faso (76%), Benin (75%), Cameroon (74%), Burundi (72%), Guinea (71%), Congo, Rep. (71%),
50%-69%	Swaziland (69%), Senegal (69%), Liberia (68%), Uganda (67%), Central African Republic (67%), Rwanda (65%), Guinea-Bissau (61%), Eritrea (61%), Zambia (60%), Togo (60%), Kenya (59%), Nigeria (58%), Sudan (57%), Mali (56%), Tanzania (54%), Libya (54%), Chad (50%), Angola (50%)
Less than 50%	Sierra Leone (49%), Mauritania (49%), Niger (48%), Mozambique (47%), Democratic Republic of the Congo (46%), Equatorial Guinea (45%), Madagascar (41%), Ethiopia (38%), Somalia (30%),

Source: WHO/UNICEF Database (2008 data)

Furthermore, the urban-rural disparities are particularly striking in Sub-Saharan Africa. Use of improved drinking-water sources in urban areas is almost double the use in rural areas of the region. Only Comoro (Urban 91%, Rural 97%) shows higher rate of rural access.

Figure 4 : Urban-Rural Disparities of Access to Clean Drinking Water

	Urban		Rural		Total	
Sub Region	Proportion of Population served with Improved Water	Proportion of Population served with Piped water	Proportion of Population served with Improved Water	Proportion of Population served with Piped Water	Proportion of Population served with Improved Water	Proportion of Population served with Piped Water
North Africa	95%	91%	87%	68%	92%	80%
Sub-Saharan Africa	83%	35%	47%	5%	60%	16%

Source: WHO/UNICEF Database (2008 data)

In addition, there are huge deficiencies in the number of Africans who are able to obtain water through piped systems – the safest and most economical method of distributing water. The people who do not have piped water in dwelling (including yard or plot) have obtained water through public tap/standpipe, tubewell/borehole, protected dug well, protected spring and/or rainwater collection.

As shown in Figure 5, the countries with over 50% of household connection are only 8 countries; Mauritius, Egypt, Tunisia, Algeria, Djibouti, South Africa, Botswana, and Morocco. All of them show over 80% of access to safe drinking water. On the other hand, less than 10% of people are able to access to tap water in their premise in 20 countries.

Figure 5 : Rate of piped water on premise (household connection)

Rate of Access to piped water on premise	Country
More than 89%	Mauritius (99%), Egypt (92%),
70%-89%	Tunisia (76%), Algeria (72%), Djibouti (72%),
50%-69%	South Africa (67%), Botswana (62%), Morocco (58%)
30%-49%	Namibia (44%), Gabon (43%), Cote d'Ivoire (40%), Cape Verde (38%), Senegal (38%), Zimbabwe (36%), Gambia (33%), Swaziland (32%), Comoros (30%),
10%-29%	Congo, Rep. (28%), Sudan (28%), São Tomé and Príncipe (26%), Mauritania (22%), Angola (20%), Lesotho (19%), Kenya (19%), Somalia (19%), Ghana (17%), Cameroon (15%), Zambia (14%), Benin (12%), Mali (12%), Guinea (10%),
Less than 10%	Guinea-Bissau (9%), Eritrea (9%), Congo, Dem. Rep. (9%), Tanzania (8%), Mozambique (8%), Malawi (7%), Niger (7%), Madagascar (7%), Ethiopia (7%), Burundi(6%), Togo (6%), Nigeria (6%), Sierra Leone (6%), Equatorial Guinea (6%), Chad (5%), Burkina Faso (4%), Rwanda (4%), Uganda (3%), Liberia (2%), Central African Republic (2%),

Source: WHO/UNICEF Database (2008 data)

A recent study on African Water Infrastructure, "Africa's Infrastructure: A Time for Transformation" (AICD) points that “39 percent of the urban population of Sub-Sahara Africa is connected to a piped network, compared with 50 percent in the early 1990s. Rapid population growth and rampant urbanization have put enormous on utilities”. The shortfall and the delay of water supply development are attributable, in large part, to a lack of investment resources available to utilities and service providers. From this point of view, public and/or private finance is essential for water infrastructure development in Africa.

2.1.2 Water service level

The poor services accelerate defects of water infrastructure. It means that water utilities are not able to collect enough tariff if they could not provide good services. As the result, they cannot invest enough money to water supply system and the service level is getting worse. Therefore, it is essential for maintaining the facilities to provide good services that utilities ensure reliability from customer and cost effective performance.

Figure 6 : Water Service Level

Country	Basic Information							Water Service Level															
	GNI 2008	GNI per capita 2008	Total population 2008	Urban population 2008	Rural population 2008	Average annual population growth 1990-2008/2008-2015	Under five mortality rate 2005-2010 M/F	Access to safe drinking water 2008 (Ratio, Total)	Access to safe drinking water 2008 (Population, Total)	Access to safe drinking water 2008 (Ratio, Urban)	Access to safe drinking water 2008 (Population,	Access to safe drinking water 2008 (Ratio, Rural)	Access to safe drinking water 2008 (Population, Rural)	Piped on premise 2008	Population served by utility, water 2008	continuity of service 2006	Ratio of non-revenue water		Collection ratio of water bill	Operating cost coverage	Number of staff per 1000 connections	Number of staff per 1000 people	Annual water bill for HH consuming 6 m3 per month
	billion US$	US$	million	million	million	%	‰	%	million	%	million	%	million	%	million	hours	year	%	%	-	people	people	US$/year
Algeria	144.2	4190	34.4	22.4	12.0	1.7/1.5	35/31	83	28.55	85	19.04	79.0	9.48	72.0	24.8	12	N.A	N.A	N.A	N.A	10	N.A	N.A
Angola	60.2	3340	18	10.2	7.8	2.9/2.6	220/189	50	9.00	60	6.12	38.0	2.96	20.0	3.6	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Benin	6.1	700	8.7	3.6	5.1	3.3/2.9	123/118	75	6.53	84	3.02	69.0	3.52	12.0	1.0	24	2009	28	91	1.96	4.8	0.4	56
Botswana	12.8	6640	1.9	1.1	0.8	2.0/1.3	60/47	95	1.81	99	1.09	90.0	0.72	62.0	1.2	24	N.A	N.A	N.A	N.A	18.2	N.A	N.A
Burkina Faso	7.3	480	15.2	3.0	12.2	3.0/3.2	160/154	76	11.55	95	2.85	72.0	8.78	4.0	0.6	24	2009	18	95 (2005)	2.07	3.5	0.2	57.6
Burundi	1.1	140	8.1	0.8	7.3	2.0/2.2	177/155	72	5.83	83	0.66	71.0	5.18	6.0	0.5	15	2006	40	97	2.76	15.5	0.7	9.4
Cameroon	21.9	1150	19.1	10.8	8.3	2.5/2.1	151/136	74	14.13	92	9.94	51.0	4.23	15.0	2.9	24	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Cape Verde	1399	2800	0.499	0.2994	0.2	N.A	38/23	84	0.42	85	0.25	82	0.16	38	0.2	N.A	2005	31	N.A	N.A	23.7	5.9	N.A
Central African Republic	1.8	410	4.3	1.7	2.6	2.2/1.8	196/163	67	2.88	92	1.56	51.0	1.33	2.0	0.1	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Chad	5.9	540	10.9	2.9	8.0	3.2/2.6	220/201	50	5.45	67	1.94	44.0	3.52	5.0	0.5	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Comoros	483	750	0.644	0.18032	0.5	N.A	71/54	95	0.61	91	0.16	97	0.45	30	0.2	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Congo, Dem. Rep.	9.8	150	64.3	21.8	42.5	3.1/2.7	209/187	46	29.578	80	17.44	28	11.90	9	5.787	11	2005	35	52	0.64	N.A	N.A	N.A
Congo, Rep.	6.5	1790	3.6	2.2	1.4	2.2/2.2	135/122	71	24.42	95	20.71	34.0	14.45	28.0	18.0	24	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Cote d'Ivoire	20.3	980	20.6	10.0	10.6	2.7/2.3	129/117	80	16.48	93	9.30	68.0	7.21	40.0	8.2	24	N.A	19	95	0.99	2.6	0.2	39.2
Djibouti	957	1130	0.849	0.73863	0.1	N.A	134/116	92	0.78	98	0.72	52.0	0.06	72.0	0.6	15	2006	18	N.A	N.A	15	N.A	N.A
Egypt, Arab Rep.	146.8	1800	81.5	34.8	46.7	1.9/1.7	42/39	99	80.69	100	34.80	98.0	45.77	92.0	75.0	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Equatorial Guinea	9875	14980	0.659	0.25701	0.4	N.A	177/160	43 (2000)	14.79	45 (2000)	10.08	42 (2000)	5.04	6 (2000)	0.0	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Eritrea	1.5	300	4.9	1.0	3.9	2.5/2.8	78/71	61	2.99	74	0.74	57.0	2.22	9.0	0.4	6	N.A	N.A	N.A	N.A	10	N.A	N.A
Ethiopia	22.4	280	80.7	13.7	67.0	2.9/2.5	138/124	38	30.67	98	13.43	26.0	17.42	7.0	5.6	22	2006	33	36	4.18	7.7	0.5	23.2
Gabon	10.6	7320	1.4	1.2	0.2	2.5/1.8	65 / 75	87	1.20	95	1.10	41	0.10	43	0.6	24	2005	18	N.A	1.01	5.5	0.8	N.A
Gambia	0.7	400	1.7	0.9	0.8	3.4/2.5	123/109	92	1.56	96	0.86	86.0	0.69	33.0	0.6	N.A	2005	17	94	0.79	N.A	N.A	N.A
Ghana	14.7	630	23.4	11.7	11.7	2.5/1.9	119/115	82	19.19	90	10.53	74.0	8.66	17.0	4.0	24	2008	40.5	91	1.15	N.A	N.A	44.1
Guinea	3.5	350	9.8	3.4	6.4	2.6/2.6	157/138	71	6.96	89	3.03	61.0	3.90	10.0	1.0	8	2008	46	64	0.78	N.A	N.A	21
Guinea-Bissau	0.4	250	1.6	0.5	1.1	2.4/2.3	207/186	61	0.98	83	0.42	51.0	0.56	9.0	0.1	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Kenya	28.4	730	38.8	8.4	30.4	2.8/2.6	112/95	59	22.89	83	6.97	52.0	15.81	19.0	7.4	15.8	2006	49	113	1.91	6.95	0.5	64.2
Lesotho	2.2	1060	2	0.5	1.5	1.4/0.8	112/96	85	1.70	97	0.49	81.0	1.22	19.0	0.4	18	2008	28	98	1.04	N.A	N.A	31.8
Liberia	0.7	170	3.8	2.3	1.5	3.1/3.3	144/136	68	2.58	79	1.82	51.0	0.77	2.0	0.1	12	2006	70	75	1	24.9	N.A	N.A
Libya	77.9	12380	6.3	4.9	1.4	2.0/1.8	20/19	54 (2000)	18.58	54 (2000)	12.10	55 (2000)	6.60	N.A	N.A	24	N.A	N.A	N.A	N.A	58.7	N.A	N.A
Madagascar	7.9	420	19.1	5.6	13.5	2.9/2.5	105/95	41	7.83	71	3.98	29.0	3.92	7.0	1.3	N.A	2005	34	43	1.5	N.A	N.A	33.6
Malawi	4.2	280	14.8	2.8	12.0	2.5/2.7	125/117	80	11.84	95	2.66	77.0	9.24	7.0	1.0	16.3	2009	40	86	1.15	16.2	1	31.4
Mali	7.4	580	12.7	4.1	8.6	2.1/2.7	193/188	56	7.11	81	3.32	44.0	3.78	12.0	1.5	24	2009	27	99	1.96	4.8	0.2	46.4
Mauritania	2.6	840	3.2	1.3	1.9	2.7/2.1	128/112	49	1.57	52	0.68	47.0	0.89	22.0	0.7	8	2008	38	84 (2007)	0.45 (2007)	21.6	2.9	8.4
Mauritius	8.5	6700	1.3	0.5	0.8	1.0/0.4	20/15	99	1.29	100	0.50	99.0	0.79	99.0	1.3	24	2006	54	102	2.48	3.2	0.8	26.8
Morocco	80.8	2520	31.6	17.7	13.9	1.3/1.2	43/29	81	25.60	98	17.35	60.0	8.34	58.0	18.3	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Mozambique	8.4	380	22.4	8.2	14.1	2.8/2.1	162/144	47	10.50	77	6.30	29	4.10	8	1.8	16	2007	59	85	0.82	14.7	1	
Namibia	9	4210	2.1	0.8	1.3	2.3/1.8	58/45	92	1.93	99	0.79	88.0	1.14	44.0	0.9	24	2009	14	69	1.48	2.4	0.5	92.6
Niger	4.8	330	14.7	2.4	12.3	3.4/3.8	171/173	48	7.06	96	2.30	39.0	4.80	7.0	1.0	24	2009	16	87	1.3 (2005)	5.4	0.4	36.3
Nigeria	177.4	1170	151.2	73.1	78.1	2.4/2.4	190/184	58	87.70	75	54.83	42.0	32.80	6.0	9.1	11.5	2009	31	58	0.52	52.2	0.4	56.2
Rwanda	4.3	440	9.7	1.8	7.9	1.7/2.7	167/143	65	6.31	77	1.39	62.0	4.90	4.0	0.4	12	2005	32	99	0.9	39.1	0.6	81.4
São Tomé and Príncipe	164	1030	0.16	0.0976	0.1	N.A	N.A	89	0.14	89	0.09	88	0.05	26	0.0	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
Senegal	11.9	980	12.2	5.2	7.0	2.7/2.5	125/114	69	8.42	92	4.78	52.0	3.64	38.0	4.6	24	2006	19	99	1.28	2.6	N.A	29.4
Seychelles	889	10220	0.087	0.04872	0.0	N.A	N.A	N.A	N.A	100	0.05	N.A	N.A	N.A	N.A	24	2006	14	100	0.44	18.2	5.2	102.2
Sierra Leone	1.8	320	5.6	2.1	3.5	1.7/2.4	160/136	49	2.74	86	1.81	26.0	0.91	6.0	0.3	15	N.A	N.A	N.A	N.A	27.6	N.A	N.A
Somalia	N/A(*1)	N/A(*1)	8.9	3.3	5.6	1.7/2.6	186/174	30	2.67	67	2.21	9.0	0.50	19.0	1.7	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
South Africa	283.2	5820	48.7	29.6	19	1.8/0.7	79 / 64	91	44.30	99	29.30	78	14.80	67	32.6	24	2006	28	79	0.89	37.35	0.4	N.A
Sudan	45.7	1100	41.3	18.0	23.3	2.3/2.0	117/104	57	23.54	64	11.52	52.0	12.12	28.0	11.6	24	2009	9	14 (2005)	2.03	71.42	0.9	9.5
Swaziland	3	2600	1.2	0.3	0.9	1.7/1.4	111/92	69	0.83	92	0.28	61.0	0.55	32.0	0.4	24	2009	40	97	1.06	N.A	N.A	N.A
Tanzania	18.4	440	42.5	10.8	31.7	2.8/2.9	112/100	54	22.95	80	8.64	45.0	14.27	8.0	3.4	17.2	2009	46	103	0.87	5.7	0.3	35.7
Togo	2.6	410	6.5	2.7	3.8	7.6/2.8	105/91	60	3.90	87	2.35	41.0	1.56	6.0	0.4	24	2004	20	71	1.2	12.3	0.6	69.7
Tunisia	36	3480	10.3	6.9	3.4	1.3/1.1	24/21	94	9.68	99	6.83	84.0	2.86	76.0	7.8	24	2006	23	100	0.8	N.A	N.A	N.A
Uganda	13.3	420	31.7	4.1	27.6	3.2/3.2	129/116	67	21.24	91	3.73	64.0	17.66	3.0	1.0	24	2009	36	99	1.34	5.7	0.6	61.7
Zambia	12	950	12.6	4.5	8.1	2.6/2.4	169/152	60	7.56	87	3.92	46.0	3.73	14.0	1.8	17.2	2009	45	76	1.16	9.2	N.A	56.5
Zimbabwe	N/A(*1)	N/A(*1)	12.5	4.7	7.8	1.0/1.7	100/88	82	10.25	99	4.65	72.0	5.62	36.0	4.5	24	N.A	N.A	N.A	N.A	4.75	N.A	N.A
Data source	a	a	a	a	a	a	b	c	c	c	c	c	c	c		e		e	e	e	e*2	e	d

Data source:

a. World Bank, 2010, World Development Indicators

b. UNFPA. 2010, State of World Population Report 2010

c. WHO, UNICEF, 2010, Progress on Sanitation and Drinking Water 2010 update

d. WSP, UN-HABITAT, ESAR, 2009, Water Operators Partnerships

e. The International Benchmarking Network for Water and Sanitaion Utilities (IBNET)

f. FAO-AQUASTAT

Note:

*Population of Access to safe drinking water in both urban and rural in Cape Verde, Comoros, Equatrial Guinea, São Tomé and Príncipe, Sey

*The figure of colored pink cell based on reference "d".

*The figure of colored lirht yellow cell based on reference "e".

*1 estimated to be low income country

*2 very rough estimation calculated from available data from IBNET

This Study reviews the water service level with following statistic data from "The International Benchmarking Network for Water and Sanitation Utilities (IBNET)" and WOPs – Africa Utility Performance Assessment (WOPs Report). Figure 6 shows the result of collection of those data[3] and followings are major findings.

Continuity of service

Continuity of service is defined in terms of the average hours of service a day. It is important for customers to receive good quality water when they need. Inefficiencies resulting from the poor state of repair of water infrastructure, institutional weakness and a lack of financial viability often make it difficult to have potable water from pipes. The average hour of service from available data is 19.4 hours. 22 countries provide 24 hours service while 5 countries provide less than 12 hours of service to their customers. According to WOPs Report, Utilities of Southern region provide on average 21 hours while those in Eastern and Western region provide an average of 18 and 13 hours, respectively. The low average of Western region is heavily skewed by Nigerian utilities that many of which provide less than 10 hours of service.

Non-revenue water (NRW) ratio

NRW is calculated from difference between water supplied and water sold (i.e. volume of water "lost"), expressed as a percentage of net water supplied. The ratio of NRW indicates poor system management and commercial practices as well as inadequate network maintenance. The data presented by WOPs Report shows little regional variation in NRW levels expressed as a percentage. The regional average NRW ratio of Eastern Africa, Western Africa and Southern Africa as 38%, 34% and 36%. The data from IBNET shows almost similar average of 32%. Utilities in other developing countries report similar level of NRW and it suggests that NRW is a global problems[4]. Based on WOPs Report, utilities in South Africa show relatively good performance in NRW management. Also the utilities introduced PPP, like SEEN in Niger, ONEA in Burkina Faso, SDE in Senegal show good performance.

Collection ratio of water bill

Collection ratio is defined as the ratio of a utility's actual revenues (cash income) collected and total billed revenues, expressed as a percentage. On average of WOPs report, most utilities are only able to collect about 73%, and an average of Eastern Africa for 76%, Western Africa for

[3] It is noted that the figures are different among the data sources because the original figure from utilities (e.g. year, sample utilities, etc.) and/or the concepts/definitions and methods of calculation are different among the data sources. It is also noted that the figures of each country are simple averages calculated from available utilities data. The definition of region of each report is also different.

[4] An average of 39% for EAC and LAC, and 36% for EAP.

66%, and Southern Africa 77%. The figures are a little bit lower than other regions.[5] Poor collection efficiency is blamed on customers but the utility may also be at faulty billings, inadequate responses to consumer queries on billings, poor customer service and lukewarm effort to collect overdue accounts. Furthermore, most of utilities encountered difficulties in collecting bills from public agencies.

Operating cost coverage ratio

Operating cost coverage ratio (OCCR) is defined as the ratio of total billed revenues to total annual operating costs (excluding interest and depreciation). An OCCR value greater than one means that revenues from tariffs cover the operation and maintenance (O&M) costs. An OCCR value less than one indicate that a utility barely covers its O&M costs. To recoup capital expenditure, it is preferable that OCCR is over 1.5. However two-thirds countries do not reach the benchmark and the average of countries is 1.36. One of the main reasons of low OCCR in many countries is low tariff setting for political matter. Furthermore, WOPs Report points that calculation of OCCR values is usually based on billed revenues rather than actual collection and OCCR based on actual collection is much lower than OCCR based on billings.

Number of staff per 1000 connections

Number of staff per 1000 connections expresses efficient utilization of human resources in a utility. It relates the number of staff to the number of connections, with good performance manifested by a low staff per 1000 connection ratio while a high ratio may indicate inefficient use of human resources. A frequently used benchmark for staff productivity is five employees per 1000 connections for developing countries. Based on the available data of utilities, the average staff number is 17, which is more than three times of preferable staff number. However, some utilities achieved the number below five, while some other utilities have more than 100 staff per 1000 connection. It is noted overmuch staff employment is one of measures to counter unemployment in weak economic countries.

2.1.3 Allocation of water resources

Water resources allocation is a vital issue for water scarcity and stress countries whose total internal renewable water resource per capita is less than 1000m^3/person/year and less than 1700m^3/person/year respectively. According to FAO database "AQUASTAT", there are 10 water scarcity countries and 9 water stress countries in African continent in 2008.

[5] An average of 88% for EAC, 87% for LAC, and 89% for EAP.

In this region, agricultural water use accounts for about 63% of total consumption - mainly through crop irrigation - while industrial use accounts for about 9%, and the remaining 27% is used for domestic purposes. Comparing to the world withdrawal, industrial use in the region is almost a half of it. The agricultural withdrawal in Africa is less than 10% from the world ratio, while domestic withdrawal is five times. It is noted that Water Resources Withdrawal Ratio in water scarcity and stress countries show similar ratio of the world. (Figure 7) In the context of stress and scarcity, the lack of potable water may be the result of current usage and the failure of policymakers to re-allocate it to population sectors.

Figure 7 : Water Resources Withdrawal Ratio in Africa and World

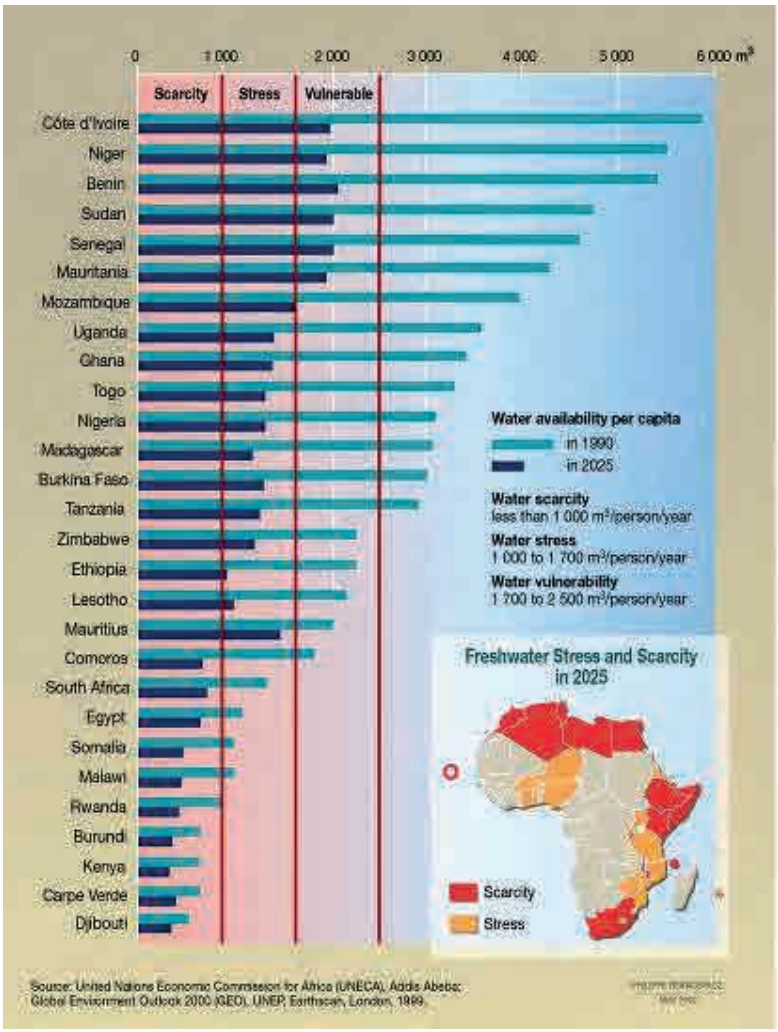
	World *1	Africa continent *2	Water scarcity countries in Africa*2	Water stress countries in Africa*2
Agriculture	75%	63%	72%	75%
Industry	20%	9%	22%	18%
Domestic	5%	27%	4%	6%

Source:*1: UNEP, *2: AQUASTAT

The accelerating global climate changes will undoubtedly cause major changes in the patterns of water cycle and geographical distribution in Africa. Some regions will receive less precipitation, some more, and this will significantly affect renewable water for potable water and agricultural activity, industrial and commercial usage. Based on the estimation of UNEP, in most of all African countries, water availability per capita in 1990 will be less than half in 2025. (Figure 8)

Applying non-traditional water technologies such as desalination and wastewater re-use is getting popular in water scarcity and stress countries, and this will be one of the solution for the climate change and irrational water resource allocation.

Figure 8 : Estimation of Water availability per capita in 1990 and in 2025



Source：UNEP Vital Water Graphics An Overview of the State of the World's Fresh and Marine Waters - 2nd Edition - 2008

2.1.4 Access to improved sanitation facilities and sewerage system

In the vast majority of Sub-Sahara African countries, less than half the national population uses improved sanitation, and rates of open defecation, often on land close to sources of drinking water, remain high. Under this circumstance waterborne illnesses, diarrhea in particular, are a major health concern, and in 2008 three sub-Saharan countries – Nigeria, the Democratic Republic of the Congo, and Ethiopia – ranked second, third, and fourth (behind India, with a much larger population) in estimated number of diarrhea-related deaths among children under age five.

The disparity of the use of improved sanitation facilities between urban and rural is also striking in Sub Sahara Africa as shown in Figure 9. Fewer than 40% of rural residents in every country excluding South Africa and Gambia use improved sanitation facilities. Rural areas continue to have a lower percentage of population using improved sanitation and higher number of people without improved facilities. However, rural access rates in Kenya, Malawi, Rwanda and Uganda are higher than urban rates.

Figure 9 : Urban-Rural Disparities of Access to Improved Sanitation

Sub Region	Urban Proportion of Population with Improved sanitation	Rural Proportion of Population served with Improved Water	Total Proportion of Population served with Improved Water
North Africa	94%	83%	89%
Sub-Saharan Africa	44%	24%	31%

Source: WHO/UNICEF Database (2008 data)

Regarding sewerage service coverage, it is very difficult to collect national ratio and we found only 20 countries' figures from IBNET whose average of access rate is 22%. Average rates of sewerage coverage ratio in utilities' service area are 45% (The Africa Infrastructure Country Diagnostic database; AICD) and 40% (IBNET). According to available data from period 2001-2008 on AICD database, national average rate of access to flush toilet/septic tank as primary sanitation is 9.4% (1.8% in rural and 22.5% in urban). From this data it might to be said that sewerage services are only provided in limited urban areas.

Figure 10 : Average rate of access to sanitation facilities

	National	Urban	Rural
Access to no facility/nature/bush as primary sanitation	32.7%	9.2%	42.4%
Access to bucket/pan as primary sanitation	0.3%	0.6%	0.2%
Access to other sanitation as primary sanitation	0.4%	0.5%	0.5%
Access to traditional pit latrine as primary sanitation	45.3%	47.1%	46.4%
Access to vip latrine/san plat/chemical toilet/blair as primary sanitation	12.8%	22.4%	8.8%
Access to flush toilet/septic tank as primary sanitation	9.4%	22.5%	1.8%

Source: AICD database

2.2. Funding needs

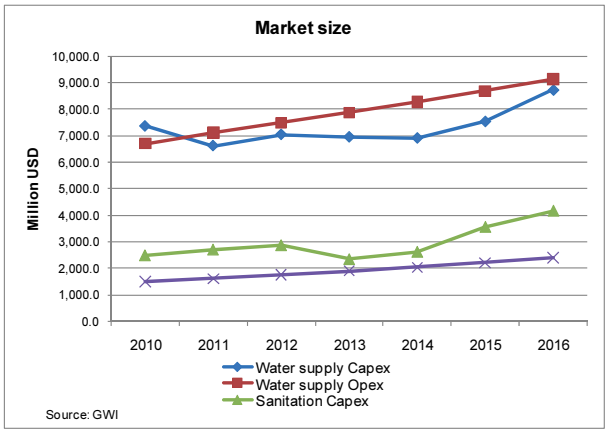
According to Global Water Intelligence, the total investment needs (regardless of funding source) and growth of the water sector in Africa (53 countries) are as large as follows:

Figure 11

			2010	2011	2012	2013	2014	2015	2016
Water supply	Capex	million USD	7,359.7	6,609.8	7,039.6	6,945.5	6,901.0	7,531.9	8,730.3
		CAGR (2010-2016)%*	19.77%						
	Opex	million USD	6,696.3	7,114.7	7,487.9	7,866.1	8,262.0	8,684.0	9,121.9
		CAGR (2010-2016)%*	22.70%						
Sanitation	Capex	million USD	2,488.7	2,707.9	2,868.6	2,347.0	2,624.1	3,557.1	4,162.4
		CAGR (2010-2016)%*	27.88%						
	Opex	million USD	1,494.1	1,608.8	1,749.5	1,891.8	2,047.3	2,215.5	2,399.3
		CAGR (2010-2016)%*	26.76%						
WSS	Capex	million USD	9,848.4	9,317.7	9,908.2	9,292.5	9,525.1	11,089.0	12,892.7
	Opex	million USD	8,190.4	8,723.5	9,237.4	9,757.9	10,309.3	10,899.5	11,521.2

* Country data weighted averaged by the amount in 2010
Source: Capex, Opex: GWI, CAGR: Study Team calculation

Figure 12



The total market size including water supply and sanitation was estimated as 9,848.4 million USD for capex and as 8,190.4 USD for opex in 2010. The findings from these estimations are funding needs for opex are as high as capex, especially in water supply. In addition, while CAGR is higher in sanitation compared with water supply, this can be assumed that expected level of the service in sanitation is relatively lower than water supply service, depending on the level of economic growth. In this regard, lower funding needs in sanitation does not imply that the market of sanitation is matured and lower demand compared with water supply.

At country level data, the top 10 countries are as follows:

Figure 13

Top 10	Water supply capex 2010 (million USD)		Water supply capex CACR (%)		Water supply opex 2010 (million USD)		Water supply opex CACR (%)	
1	Algeria	2445.7	Ghana	48.74%	South Africa	2305.0	Libya	32.40%
2	South Africa	1909.6	Somalia	47.62%	Egypt, Arab Rep.	1225.5	Djibouti	30.83%
3	Egypt, Arab Rep.	749.4	Libya	40.67%	Algeria	690.9	Algeria	30.26%
4	Libya	695.0	Nigeria	36.84%	Morocco	585.2	Namibia	28.37%
5	Morocco	291.7	Uganda	30.52%	Libya	494.4	Niger	27.82%
6	Tunisia	201.3	Egypt, Arab Rep.	29.73%	Tunisia	296.7	Eritrea	26.67%
7	Nigeria	145.3	Zimbabwe	29.17%	Nigeria	171.3	Mauritius	26.13%
8	Sudan	104.4	Tunisia	27.93%	Sudan	166.5	Sudan	25.96%
9	Namibia	98.1	Gambia, The	27.78%	Kenya	95.6	Togo	25.42%
10	Congo, Dem. Rep.	90.0	Gabon	27.04%	Senegal	77.7	Chad	25.37%

Top 10	Sanitation capex 2010 (million)		Sanitation capex CACR (%)		Sanitation opex 2010 (million)		Sanitation opex CACR (%)	
1	South Africa	1015.7	Nigeria	114.25%	South Africa	565.5	Algeria	51.53%
2	Egypt, Arab Rep.	718.4	Mauritius	66.67%	Egypt, Arab Rep.	545.4	Mauritius	37.50%
3	Algeria	336.0	Mali	62.96%	Morocco	103.4	Morocco	33.54%
4	Morocco	210.2	Libya	51.97%	Tunisia	55.5	Libya	29.55%
5	Tunisia	74.4	Zimbabwe	41.67%	Algeria	48.0	Mali	29.17%
6	Libya	59.3	Tunisia	39.36%	Libya	39.2	South Africa	26.71%
7	Nigeria	13.1	Morocco	38.76%	Nigeria	32.6	Tunisia	25.32%
8	Ghana	11.3	Angola	33.33%	Namibia	24.4	Djibouti	25.00%
9	Tanzania	6.5	Burundi	33.33%	Kenya	9.8	Egypt, Arab Rep.	24.97%
10	Cote d'Ivoire	6.0	Congo, Rep.	33.33%	Cameroon	7.8	Zimbabwe	23.33%
			Djibouti	33.33%				
			Guinea-Bissau	33.33%				
			Gabon	33.33%				

For the water supply and sanitation, they show similar tendency for the top ten countries. For example, Northern African countries, Southern African countries and countries with large population such as Nigeria, Congo Republic and Sudan are highly ranked in terms of the capex/opex amounts as of 2010. In terms of growth, there are not only Northern African countries, but also countries such as sub-Saharan countries such as Ghana, Somalia etc.

On the other hand, the funding gap is one of indicators which could imply the potential size of the market in water sector. The term of "the funding gap" is used in several meanings, but in this Study, the following definition was used[6] to capture the potential size of the market, which shows the potential funding needs:

Funding gap = (Public investment required out of Total investment required) – (Planned public investment)

[6] The same definition is used for WB study: "Getting Africa on Track to Meet the MDGs on Water and Sanitation, A Status Overview of Sixteen African Countries, December 2006".

For estimation of the funding gap for Africa in our study, available raw data in the country level was limited. Therefore, the country level data (Total investment required to achieve MDGs, Public investment required, Planned public investment and Funding gap) was collected from 14 countries in AICD and based on these data, regression was run in order to estimate the funding gap of 53 countries. The country level data are as follows:

Figure 14

Country	Total population 2008	Urban population 2008	Rural population 2008	Average annual population growth 1990-2008	Average annual population growth 2008-2015	GNI 2008	GNI per capita 2008	Sovereign Rating (Watch/Outlook not considered)	Access to safe drinking water 2008	Access to safe drinking water 2008	Access to improved sanitation facilities 2008	Access to improved sanitation facilities 2008	Dependency ratio 2008	**Funding Gap**
	million	million	million	%	%	billion USD	USD	Lowest among 3 int'l agencies	Population, million	%	Population, million	%	%	million USD
Benin	8.7	3.6	5.1	3.3	2.9	6.1	700	B	6.53	75.0	0.12	12	60.97	-4
Burkina Faso	15.2	3	12.2	3	3.2	7.3	480	B	11.55	76.0	0.20	11	0.00	-96.45
Congo, Dem. Rep.	64.3	21.8	42.5	3.1	2.7	9.8	150	nil	29.58	46.0	1.50	23	29.85	-142
Ethiopia	80.7	13.7	67	2.9	2.5	22.4	280	nil	30.67	38.0	0.79	12	0.00	-197
Ghana	23.4	11.7	11.7	2.5	1.9	14.7	630	B+	19.19	82.0	0.66	13	43.05	-51
Kenya	38.8	8.4	30.4	2.8	2.6	28.4	730	B+	22.89	59.0	3.66	31	32.57	-57
Madagascar	19.1	5.6	13.5	2.9	2.5	7.9	420	nil	7.83	41.0	0.52	11	0.00	53
Malawi	14.8	2.8	12	2.5	2.7	4.2	280	nil	11.84	80	0.34	56	6.60	-5
Mauritania	3.2	1.3	1.9	2.7	2.1	2.6	840	nil	1.57	49.0	0.13	26	96.49	-15.2
Mozambique	22.4	8.2	14.1	2.8	2.1	8.4	380	B+	10.50	47.0	3.80	17	53.80	3
Rwanda	9.7	1.8	7.9	1.7	2.7	4.3	440	B	6.31	65	0.49	54	0.00	-29
Senegal	12.2	5.2	7	2.7	2.5	11.9	980	B+	8.418	69	1.28	51	33.51	-75.5
Uganda	31.7	4.1	27.6	3.2	3.2	13.3	420	B+	21.24	67.0	0.62	48	12.75	-23
Zambia	12.6	4.5	8.1	2.6	2.4	12	950	B+	7.56	60.0	0.03	1	23.76	-9.62
Correlation with Funding gap	**-0.78**	**-0.64**	**-0.77**	-0.15	-0.14	**-0.47**	**0.28**	0.18	**-0.73**	0.19	-0.06	0.08	**0.22**	1.00

Source: Funding gap: "Getting Africa on Track to Meet the MDGs on Water and Sanitation, A Status Overview of Sixteen African Countries, WSP, UNDP, AfDB etc.", Dependency Ratio: FAO-AQUASTAT, Others: WDI 2008

The funding gap is shown in the negative figure: -1 million USD in "funding gap" column means "1 million USD funding gap exists". In turn, if the number is positive, it is surplus.

The Study Team admits that the above explanatory variables are not necessarily exhaustive, but due to limitation of available data (especially across all 53 countries), the potentially relevant variables from available data were considered.

In order to construct the regression formula, the above variables are examined. First of all, the variables with low correlations below 0.2 were excluded: annual population growth, sovereign credit rating, access to safe drinking water (%), access to improved sanitation facilities (% and population). Next, the variables which have high correlation between variables were excluded: urban population and rural population. The correlation between these variables is as follows:

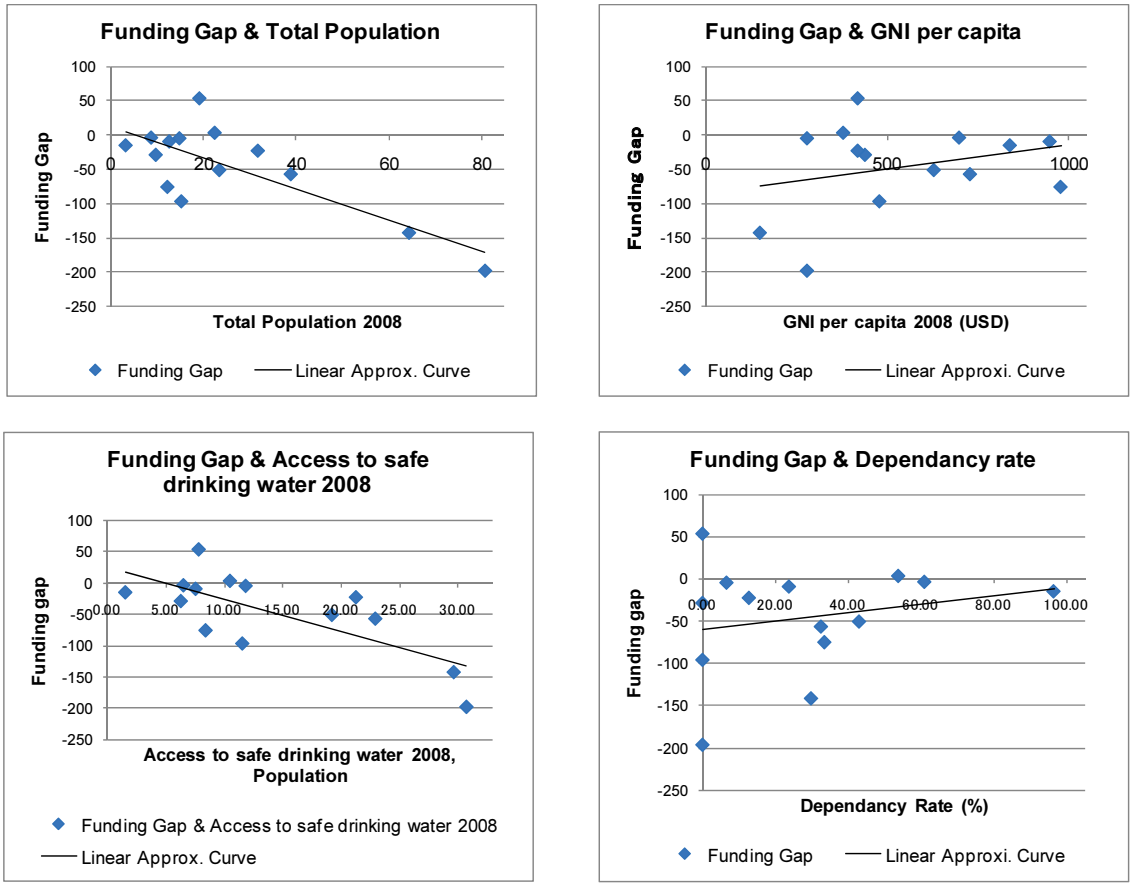
Figure 15

Variables	Urban population 2008	Rural population 2008
Correlation with total population	0.83	0.98

Since GNI is the variable which has both element from total population and GNI per capita, it was excluded from the explanatory variables in regression runs.

The regression was run with following explanatory variables: Total population 2008, GNI per capita, Access to safe drinking water 2008 (Population) and Dependency ratio 2008. (Dependency ratio means that how many percentages of water resources are taken from the other countries.) The relationship between these variables and the funding gap are illustrated in the following graphs:

Figure 16



The regression with these variables was run in the following combinations:

Case 1: 1 explanatory variable (Total population)

Case 2: 2 explanatory variables (Total population, GNI per capita)

Case 3: 2 explanatory variables (Total population, access to safe drinking water (population))

Case 4: 3 explanatory variables (Total population, GNI per capita, access to safe drinking water (population))

Case 5: 4 explanatory variables (Total population, GNI per capita, access to safe drinking water (population), dependency ratio)

Figure 17

	Case 1			Case 2			Case 3			Case 4			Case 4		
	β	*t*	P-value	β	*t*	P-value	β	*t*	P-value	β	*t*	P-value	β	*t*	P-value
Intercept	11.24	0.64	0.54	53.08	1.24	0.24	13.11	0.54	0.60	55.46	1.16	0.27	54.48	1.08	0.31
Total Population	-2.26	-4.27	0.001 *	-2.64	-4.16	0.002 *	-2.09	-1.37	0.199	-2.44	-1.56	0.150	-2.47	-1.50	0.167
GNI per capita	-	-	-	-0.06	-1.07	0.306	-	-	-	-0.06	-1.03	0.328	-0.07	-1.01	0.34
Access to safe drinking water (population)	-	-	-	-	-	-	-0.44	-0.12	0.907	-0.53	-0.14	0.89	-0.41	-0.11	0.92
Dependency ratio	-	-	-	-	-	-	-	-	-	-	-	-	0.14	0.27	0.79
R-square	0.777			0.800			0.777			0.801			0.803		
Adjuted R-square	0.570			0.575			0.531			0.534			0.486		
N	14			14			14			14			14		
F value	0.001 *			0.004 *			0.006 *			0.013 **			0.037 **		

* Significant at 1%, ** Significant at 5%

Case 2 has the highest adjusted R square and it is statistically significant at 1% level, which could be confirmed from F value. Therefore, the formula and coefficients of Case 2 were used to estimate "the funding gap" of water sector in Africa as a whole (53 countries).

$$y=\alpha+\beta_1 x_1 + \beta_2 x_2 \quad \text{..... (i)}$$

y: Funding gap

α: Intercept

β_i: Coefficient of x_i

X_1: Total population 2008

X_2: GNI per capita 2008

Based on the regression results, (i) will be shown as follows:

$$y=53.08-2.64x_1 - 0.058x_2 \text{..... (ii)}$$

In above equation's variables, the statistics of 53 African countries are as follows.

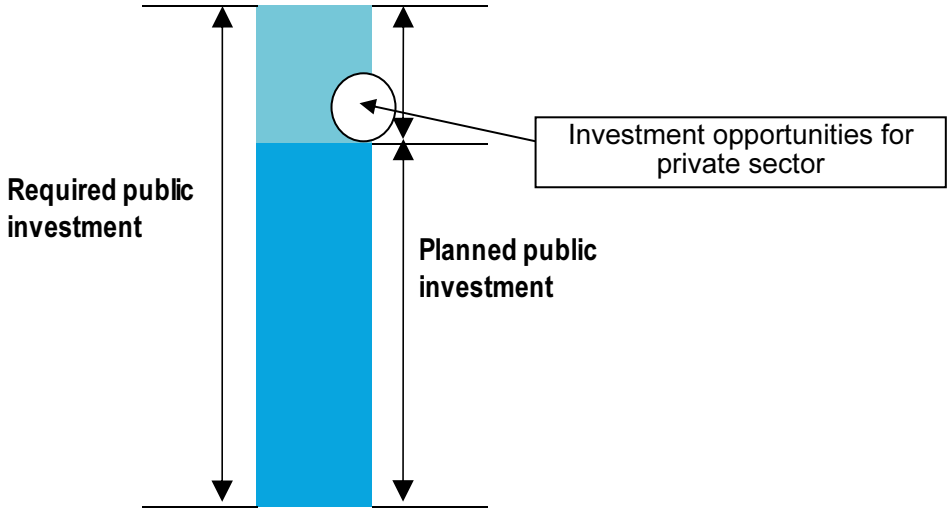
x_1: Sum of total population in 53 countries: 984.698 million

x_2: GNI per capita weighted by population: 1,383.74 USD

They were inserted in (ii) and the funding gap is estimated as 2,630.67 million USD per year.

As mentioned earlier, the funding gap shows the potential size of the market, which has not been financed yet. However, this does not mean that this will be immediately financed by the private sector for the structural reasons such as the investment environment, as soon as the capital is available from the private sector. The following diagram illustrates the relationship of the concepts.

Figure 18



(The definition of "funding gap" is based on WB report "Getting Africa on Track to Meet the MDGs on Water and Sanitation, A Status Overview of Sixteen African Countries" Dec 2006)

According to the interviews with private equity fund managers, banks and donors, investment opportunities in water sector[7] purely for private sector are very rare except desalination and water reuse in the Southern or Northern part of Africa, or investment in rural areas by micro enterprises. The possible reason is as follows:

- Lack of political wills
- Investment environment (e.g. appropriate regulatory framework, organizational set-up in

[7] The information regarding the investment opportunities is listed in the country specific sections in the following chapter.

water sector) is not in place.

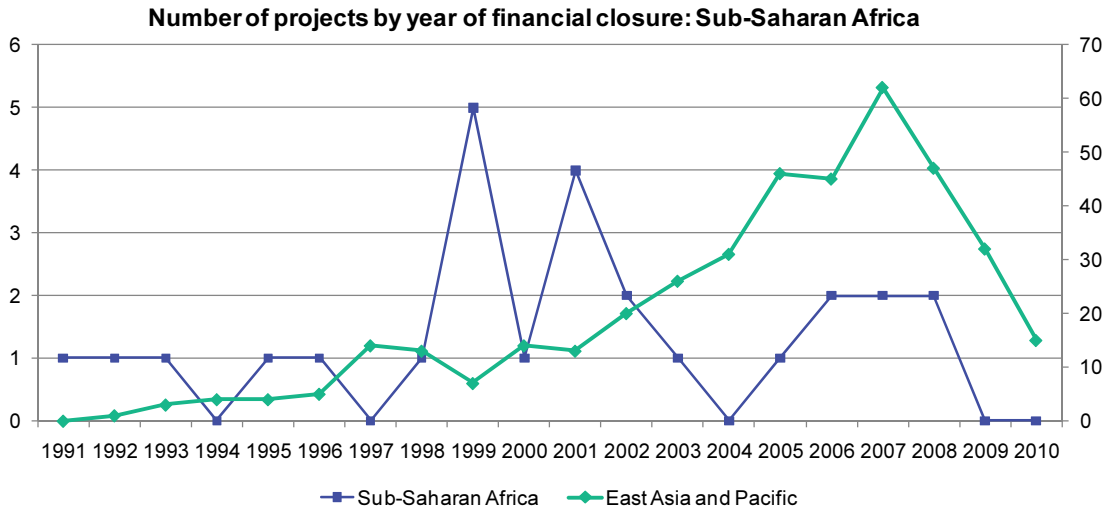
- Tariff is too low for a project to be operated as private business.
- Collection rate is low, since the policy taken in the country affects the mindset of the people (e.g. Free Water policy)

On the other hand, some private companies are recently reducing the investment appetite. (i.e. more focus on sales of equipment or facilities or only for operation, rather than the involvement with investment)

2.3. Finding from cross-country study

As discussed in the earlier part of the report, there are the strong water demand in African countries and high funding demand accordingly. In this regard, the water market in Africa has the potential. However, it does not mean that they are many projects which could be and have been attracting private companies. The number of water PPP projects in Africa has been low for the past 10 years and the cancelation rate of the projects are high, especially in the lease and concession contracts in Africa, as shown in the following graph and table.

Figure 19



(Source: World Bank, PPI database)

Figure 20 : Private sector involvement in Sub Saharan Africa, 1990-2005

Type	Number	Countries	Percentage multiutility	Percentage cancelled
Management contract	15	Chad, Congo, Dem. Rep. of, Gabon, Gambia, Ghana, Guinea-Bissau, Kenya, Madagascar, Mali, Mozambique, Rwanda, Sao Tome, South Africa, Uganda, Zambia	53	20
Lease contract	7	CAR, Gambia, Mozambique, Namibia, Niger, Senegal, South Africa, Tanzania	15	45
Concession contract	4	Comoros, Gabon, Mali, South Africa	75	50
BTO/BOO	1	South Africa	0	0
Divestiture	1	Cape Verde	100	0
Total	28	23	46	25

(Source: Ebbing Water, Surging Deficits: Urban Water Supply in Sub-Saharan Africa, AICD)

In order to assess the reasons for the limited number of water PPP projects in Africa and low surviving rates of the project, the investment environment and profitability were examined.

2.3.1 Performance of PPP projects in Africa in terms of access, quality of service and operation efficiency

The PPP projects in the selected countries (Gabon, Mozambique, South Africa, Morocco and Senegal) where the Study Team conducted the field mission are discussed below. If "success" is defined as the continuity of a PPP contract with efforts by related parties (an owner, an operator and other stakeholders) or completion of a PPP contract with satisfaction of related parties, all of the PPP Projects are considered as success in general. However the Study Team found that some PPP projects have conflicts regarding their performance. For example, in Gabon the audit pointed out in 2010 that SEEG has not met expectations in terms of service and had fallen short of its infrastructure investment target. In Mozambique, the historical performance in Maputo by AdeM was seemed as poor and caused dissatisfaction in the Mozambican governmental side. The tariff settings and investment are also major concerns of other PPP projects and some of them overcome the problems by appropriate risk allocation and revision of the contracts.

Figure 21 : Summary of the Selected PPP Projects in the Study

Country	Scope	Area Population	Type of Contract	Contract Period	Company	Status
Gabon	Water Supply (Electricity)	Livreville, etc. 850,000	Concession	1997-2017 (20 years)	SEEG	Continue, but some problems regarding investment and services recently
Mozambique	Water Supply	Maputo /Matora 1,716,632	Lease	1999-2014 (15 years)	AdeM	Continue, but dissatisfaction in the past and change of the major share-holder in 2001 & 2010
Mozambique	Water Supply	Beria 418,141	Management	1999-2008 (5 years and 3 yr & 1 yr extension)	AdeM	Completed with satisfaction
Mozambique	Water Supply	Pemba 125,635	Management	1999-2008 (5 years and 3 yr & 1 yr extension)	AdeM	Completed with satisfaction
Mozambique	Water Supply	Nampla 414,958	Management	1999-2008 (5 years and 3 yr & 1 yr extension)	AdeM	Completed with satisfaction
Mozambique	Water Supply	Quelimane 191,476	Management	1999-2008 (5 years and 3 yr & 1 yr extension)	AdeM	Completed with satisfaction
South Africa	Water Supply, Sewerage, Sanitation	Johannesburg 3,800,000	Management	2001-2006 (5 years)	Jowam	Completed with satisfaction
South Africa	Water Supply, Sewerage, Sanitation	Nelspruit 600,000	Concession	1999-2029 (30 years)	Sembcorp Silulumanzi	Continue with satisfaction
Morocco	Water Supply, Sewerage (Electricity)	Casablanca 1,000,000	Concession	1997-2026 (30 years)	Lydec	Continue with satisfaction
Morocco	Water Supply, Sewerage (Electricity)	Rabat 1,700,000	Concession	1999-2023 (25 years)	Redal	Continue with satisfaction
Morocco	Water Supply, Sewerage (Electricity)	Tangiers and Tetouan 1,200,000	Concession	2002-2026 (25 years)	Amendis	Continue with satisfaction
Senegal	Water Supply	Urban area 454,712	Affermage/ Management	1996-2013 (10 years and 5 yr & 2 yr extension)	SDE	Continue with satisfaction

(Source: The Study Team)

The detailed performance of the PPP projects is examined in terms of access, quality of service and operation efficiency, which are sometimes terms of condition of the PPP contracts. The study results are shown below.

Figure 22 : Summary of Performance of the Selected PPP Projects in the Study

Country	Company	Access	Quality of Services			Operational Efficiency		
			Water Quality	Service Hours	Customer Satisfaction	Staff productivity	UFW/NRW /Network Efficiency	Collection Efficiency
Gabon	SEEG	Improved, but dissatisfied of the Government recently	N/A	N/A	N/A	Improved	Improved	Improved
Mozambique	AdeM/ Maputo	Improved, but below the target	N/A	Not improved	N/A	N/A	Not improved	Improved
Mozambique	AdeM/ Beria	Improved	N/A	Improved	N/A	N/A	Improved	N/A
Mozambique	AdeM/ Pemba	Improved	N/A	Improved	N/A	N/A	Improved	N/A
Mozambique	AdeM/ Nampla	Improved	N/A	Not improved recently	N/A	N/A	Improved	N/A
Mozambique	AdeM/ Quelimane	Improved	N/A	Improved	N/A	N/A	Improved	N/A
South Africa	Jowam/ Johannesburg	Improved	Improved	Improved	N/A	Improved	N/A	Improved
South Africa	Sembcorp Silulumanzi /Nelspruit	Improved	N/A	Improved, but not improved in informal settlement	N/A	N/A	N/A	Improved
Morocco	Lydec/ Casablanca	Improved	N/A	N/A	Improved	N/A	Improved	N/A
Morocco	Redal/ Rabat	Improved	N/A	N/A	Improved	N/A	Improved	N/A
Morocco	Amendis/ Tangiers and Tetouan	Improved	N/A	N/A	N/A	N/A	Improved	N/A
Senegal	SDE	Improved	Improved	N/A	Improved	Improved	Improved	Improved

(Source: The Study Team)

As shown in the Figure above, all of the PPP Projects have had a positive impact on access expansion. Even though AdeM/Maputo has not reached the target, the coverage has slightly

increased from 33% (2002) to 42% (2009). The main factor of access expansion in those cases is timely appropriate investment by the governments and/or the operators. It is noted that most financing for investment came from donors and tariff revenue and the PPPs have not produced major inflow of private capital. On the other hands, unexpected large water demand by rapid urbanization is a critical obstacle of access expansion. In the case of Maputo, Mozambique and Gabon, the operator insisted that population increase overwhelm size of investment. In Morocco and Senegal, social connection program contributed the access of poor people and then total access expansion.

Regarding Quality of Services, it is difficult to evaluate them because the data collected is very limited. However, it can be said that water quality in Johannesburg in South Africa and Senegal have been improved, and that service hours has been improved in Mozambique and South Africa, except Maputo in Mozambique and informal settlement in Nelspruit, South Africa. Customer Satisfaction has been greatly improved in Morocco and Senegal.

Although the data of Operational Efficiency is also limited, the available data shows the improvements of staff productivity, network efficiency (NRW, UFW), and collection efficiency in the most of all PPP projects. This may be because the operational efficiency shall have direct impacts on their profit and loss. It is noted that most private operators accept the staff of former public water utilities and they achieve the high staff productivity by access expansion without any recruitment. Network efficiencies are also improved at most of all PPP projects except AdeM/Maputo, because huge number and scale of inadequate infrastructure (lack of water meter, etc.) was handed over to AdeM from the past parastatal regime. Although collection efficiencies have been improved in most of the PPP projects, collection from the governmental agencies has been a recurrent problem in Senegal and others.

2.3.2 Investment environment

Although the investment environment is highly country specific, many interviewees in our study mentioned that the largest obstacle to water PPP in Africa was not the lack of funds but the lack of bankable projects. Considering this point, the environment and conditions contributing to PPP project formulation and surviving without cancellation were examined.

(1) Public sentiment against the private sector involvement in water sector

There is a strong notion among African governments and their people that the water, which is

their scarce national resource, should be a public good but not an economic commodity, and are better managed by the public sector to be made available for all people as one of their basic human rights.

Partly, that is why in many countries of Africa, there seems to remain implicit consensus that water resources should be kept and managed by the government and should not be left to private sectors, and this sentiment sometimes arouses political and philosophical debates and prevents private sector participation in water business in Africa. This sentiment sometimes works as the disincentive for the government (or the authority to be in charge of water related service) not to involve the private sector in the water sector. For example, one of the municipalities in South Africa started the concession contract 10 years ago and this project has been performing well for both of the municipality and the operator. Despite this good experience, the number of PPP projects in water sector is not necessarily many due to the political environment against the private sector involvement in water sector.

In the different context also, the political will appears to be very important to promote PPP in Africa. For example, the tariff level affects the financial viability of the project greatly. Its level and its collection rate are affected by the income level of the country and we tend to assume that higher income level is the important factor to adapt PPP scheme, when we are looking at the economic aspect of a project. However, Gabon and Mozambique have more aggressive private participation scheme or promotion of PPP (concession contract in Gabon and establishment of asset holding companies for PPP scheme Mozambique) while South Africa, where its economic level is much higher, does not necessarily have the great number of projects in the form of concession and management contracts despite the satisfactory performance in the existing projects and is not necessarily promoting PPP for water sector in the country. Behind these phenomena, there are mindsets that the precious resource and basic human rights such as water, access to water need to be publically managed and the water tariff is kept low based on the mindset that access to water is basic human rights.

(2) Tariff setting

Based on the prevailing notion mentioned above, the people perceive that the water should be provided for the free of charge[8] or at a minimal cost. Therefore, in many African countries, law makers tend to set very low water tariffs to attract votes in the election. The level of the water

[8] For example, in South Africa, as a part of government's strategy to alleviate poverty, in South Africa, a Free Basic Water policy is in place, which ensures the provision of a free basic level of water for the people regardless the people's ability to pay, placing the water under state control and license.

tariff could be one of the crucial political disputes, so that the politicians may want to avoid making the decision to adjust the tariff to the level to make the water operations commercially viable. Due to the low tariff levels, returns on the investments from water projects, even by mobilizing concessional loans from donors to reduce the finance costs, are relatively low and require long payback periods. This usually results in a cycle of poor services, lagging revenue collection, weak finances, inadequate maintenance, deteriorating assets and lagging coverage. As a consequence, there are quite a few public service providers who cannot even generate the management cost for the water services, and most of the governments allocate their national budget to run the water business to cover not only the investment costs, but also for the management costs, too.

A person at one donor agency said, “In Africa, an appropriate tariff for a better water infrastructure is considered more problematic than a low tariff for a poor one.” However, if a government seriously considers attracting private funds to expand water infrastructure, the proper tariff setting has to be implemented and maintained. It does not mean that tariff should pay for 100% of the costs of water infrastructure. The subsidies can be incorporated in the water policy, as long as the budgetary source can be secured in a sustainable manner. The grant aid from donors is also a very important financial resource. The problem, however, is that many African countries put inappropriate burden on taxes and the grant aids. With recognition of limited amounts of taxes and transfer, the government has to establish an appropriate water tariff.

While some argue against the raise in water tariff over the affordability to the poor, the various mechanisms exist to address this issue such as incremental tariffs based on usage or direct subsidy to the poor households. In fact, the largest beneficiaries of lower tariff are considered to be the rich and middle income families and businesses, who consume large amount of water.

(3) The government’s attitude toward involvement of public sector in water sector

Another aspect to affect PPP project by the government is the compliance of the contract by the government. For example, the delayed bill payment from public entities affects the financial viability of a project. Furthermore, no matter if tariff adjustments measures are determined in the contracts or agreements, the tariffs are not necessarily revised by the government as planned. This leads revenue decrease of private operators or increase in arrears to be paid by the governments. In Senegal, because the tariff has not been revised since 2003, the arrears to be paid by the government to the asset holding company increased significantly. Because of this,

the asset holding company could not make repayments to financial institutions, due to the delayed payments by the government, and thus financial institutions suspended disbursement for new projects.

On the other hand, the public sector's appropriate action helps the project to survive. One of the examples is the concession contract in Nelspruit in South Africa. In South Africa, the constitution declares that everyone has the right to have access to sufficient food and water (Section 27)[9]. Based on this constitution, the government has been implementing Free Basic Water policy since 2001, which guarantees people can use 6000 liters of water for free of charge. Since the concession contract was signed before this Free Basic policy, this policy changed the revenue forecast of the project completely. The government compensates the project for the shortfall of the revenue due to this policy adoption in the form of equity share grants. Without this compensation, the operator could not continue their business as planned.

(4) Institutional and legislative framework in water PPP

In order to implement successful PPP projects, the institutional and legislative frameworks need to be in place, though that is one of the necessary conditions but not the sufficient one for successful PPP projects. This framework covers the clear division of responsibility over policy formulation, regulation, financing, asset ownership and service provisions. In case of Gabon, the concession contract was tendered after the sector reform is completed: the private sector law for SEEG (the then state-owned utility company) was already approved and implemented, and all debt in arrear to the public sector has been cleared and restructuring was completed. Through this process, the bidding could attract several international operators.

As for the other example, Mozambique has also the institutional and legislative framework in place: FIPAG and AIAS (asset holding companies) were established and its responsibilities are defied by law together with CRA (regulatory body). In addition, there is the policy as "Delegated Management Framework" which clearly mentions the possibility of implementation of PPP projects. As a result, Mozambique had PPP projects with the international operator, but the performance in terms of the service was not satisfactory and the responsibility of the operation and management of water supply are back in the hand of public sectors in four cities. This shows that there are the framework in place, but does not necessarily bring the satisfactory result.

[9] http://www.info.gov.za/documents/constitution/1996/96cons2.htm

(5) Autonomy and transparency of water utilities operations

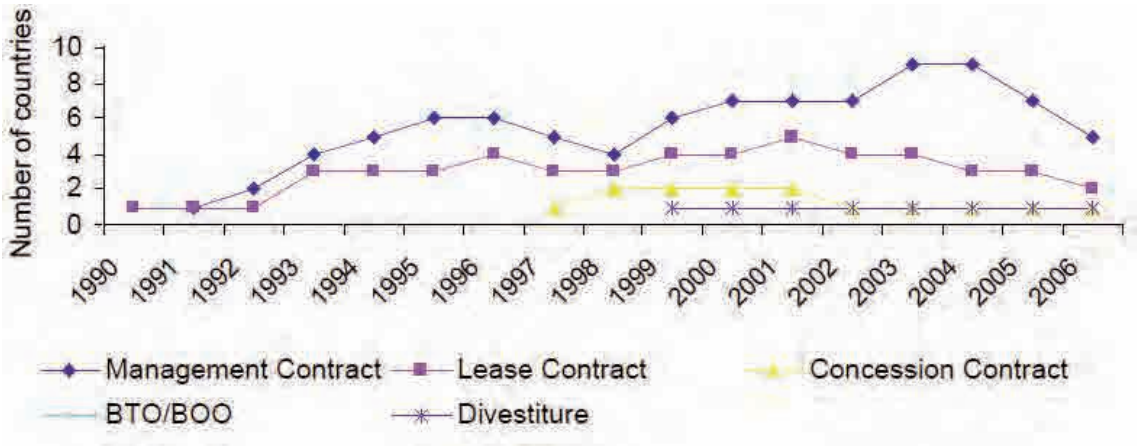
Frequent political interventions to the operation of water utilities make it difficult for private operators, investors and lenders to have faith in the management. Once the appropriate, transparent and sustainable regulatory framework is established, the management of each water utility should be left to the board of directors. It will make it easier for the water utilities to respond to the needs of the community and flexibly manage the resources. One way to achieve autonomy and transparency is to separate water service function from the municipal government and incorporate them as corporations. Governors or mayors still can oversee the operation of the water utilities as shareholders and board members while a day-to-day operation is left to the professional management team.

When water utilities are given autonomy in management, they have to operate in transparent manner in order to maintain accountability and efficiency. Water utilities should report audited financial statements in the same manner as the private organizations, so that not only the government officials but also the general public can monitor how their water utilities operate. The disclosure can also serve as a tool to persuade people to accept appropriate user charges.

(6) Investment in related infrastructure by the government

PPPs in the region have not attracted much of private capital as the next graph shows.

Figure 23 : Evolution of private sector participation



(Source: “Ebbing water, surging deficits: Urban water supply in Sub-Saharan Africa”)

Most of the capital investment is covered either by the government or aid agencies such as

international public financing. Part of the reasons could be the absence or shortage of long-term finance, but the fundamental reason is the limited number of the bankable or profitable projects in the water supply and sanitation sector. (Desalination could be different.) Profitability is discussed in the following section.

2.3.3 Profitability

The indicators to forecast the profitability will differ depending on the scheme in the contract between the stakeholders; therefore, the financial information of the existing water utility companies in Africa and the statistics such as the cost recovery ratio are examined as the alternative information.

Figure 24

	Total revenue (US$ m)		Total operating expenditure (US$ m)		Net income (US$ m)		EBITDA: revenues (%)		Operating profit margin (%)	
	F06	F07	F06	F07	F06	F07	F06	F07	F06	F07
Service Providers										
NCWSC (Kenya)	44.9	45.3	37.4	41.5	7.4	3.4	19.3	11.2	17.5	8.9
NWSC (Uganda)	31.9	38.9	29.7	35.2	(9.4)	0.6	23.9	26.4	7.0	9.7
ONEA (Burkina Faso)	38.6	48.7	39.9	52.7	2.0	1.4	39.3	38.4	(3.3)	(8.1)
SDE (Senegal)	96.8	116.2	93.4	118.3	2.3	2.8	8.7	9.3	3.6	4.4
SONEDE (Tunisia)	166.0	175.6	161.3	173.0	1.4	0.8	22.0	21.0	2.8	1.5
Asset Holding Companies										
AWSB (Kenya)	7.3	10.2	6.2	9.6	1.1	0.6	20.3	9.7	19.4	8.1
SONES (Senegal)	27.9	36.4	22.2	24.8	0.9	2.6	89.1	90.2	20.7	33.2
Comparison with other regions (FY 2010, converted to US$ based on the rate as of 4 July 2011)										
Thai Tap Water Supply PCL		145.08		n/a		67.71		66.27		46.67
Manila Water Company		255.73		81.97		92.58		67.95		n/a

(Source: "African Water Utilities, Regional Comparative Utility, Creditworthiness Assessment Report" for Africa and others)

The table above shows the key performance data for profitability of water utility companies. These samples are limited in the number due to the limited data availability. Except NWSC in 2006, the net income is positive, though EBITA/revenues ratio and operation profit margin are not necessarily high. On the other hand, these data shows low profitability compared with the data in Asia. For the potential investors, it looks more attractive to invest in Thailand and Philippines than in Africa as long as looking at these data. The number of data is limited, so this comparison cannot be generalized to all African countries. However, this could be some indication.

The other available statistics to affect profitability of the water business in Africa are cost recovery ratio (Effective tariff / historical costs) and hidden costs due to unaccounted losses. Out of 21 countries where data is available, the tariff is the cost recovery level only in two countries. On average, only 63% of the costs could be recovered. As for the hidden costs due to unaccounted losses, it is very low in Senegal and Namibia (below 1%) but it is about 30% on average. Both data shows the touch environment to make the private projects profitable only by the efforts by the private sector.

Figure 25 : Factors to affect profitability in water business in Africa

Country	Cost recovery ratio (effective tariff/historical cost, %)	Hidden costs due to unaccounted losses (% of revenue)
Benin	77.34	7.38
Burkina Faso	89.56	
Cameroon	64.77	
Cape Verde	129.73	13.03
Chad	27.46	
Congo, Dem. Rep.	82.74	44.15
Cote d'Ivoire	8.50	4.68
Ethiopia	47.15	46.59
Ghana	66.80	97.49
Kenya	58.05	37.19
Lesotho	52.62	15.44
Madagascar	33.60	12.93
Mozambique	57.32	68.73
Namibia	86.82	0.11
Niger	57.14	
Nigeria	56.24	63.00
Rwanda	73.61	36.91
Senegal	50.84	0.21
South Africa	38.94	10.71
Sudan	79.87	30.66
Zambia	101.30	82.68
Average	63.83	33.84

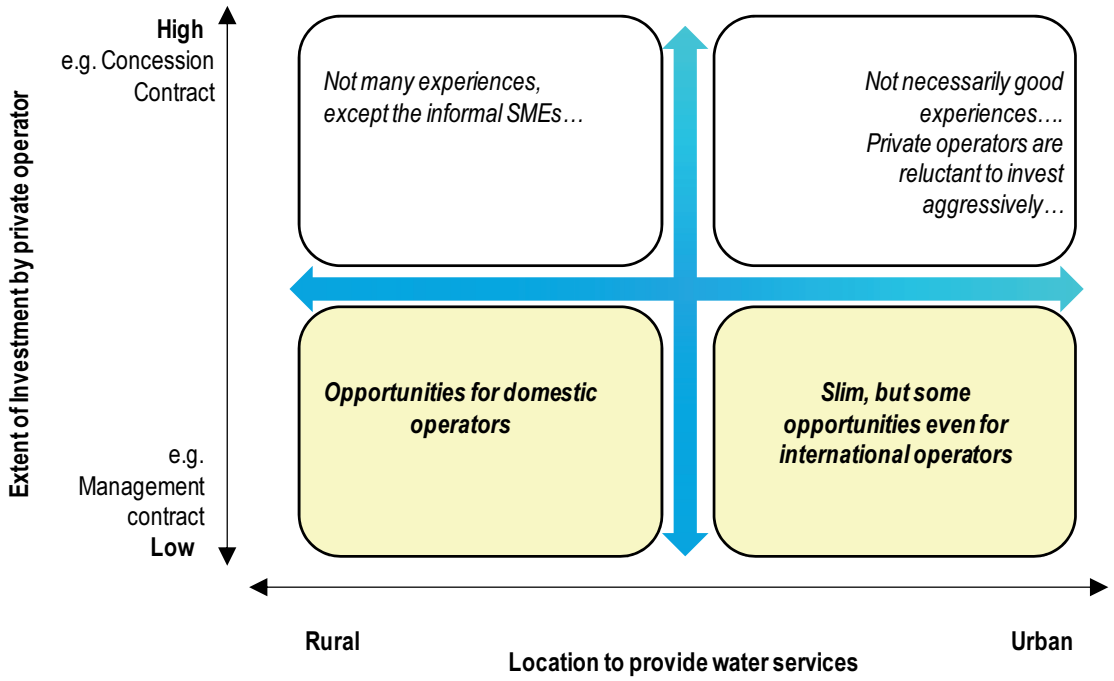
(Source: AICD)

2.3.4 Summary of market potential in water sector in Africa

The water market is large in size in terms of water demand and funding needs. However, profitability is not necessarily high so far and investment environment is the constraining factor, as well. In this case, which segment has the possibility for PPP in Africa? According to the interviews with potential private operators, they are recently reluctant to make the investment by taking risks; therefore, the appetite for investments such as the concession contract is low, even

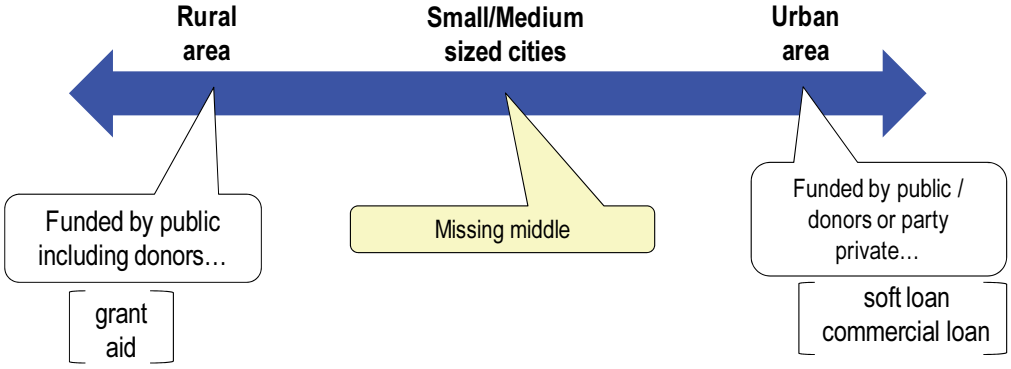
in the urban areas where the project size tends to be large enough to attract the international operators. On the other hand, the management contract has relatively more opportunities compared with the concession contract. However, the size is too small to attract international operators in case of the rural areas, thus more field for domestic operators. Based on this current situation, the funding mechanism is discussed in the following section.

Figure 26



The financing for the water service in Africa can be categorized into 3 groups according to the size of the population served. For the first category, the financing for rural water supply and sanitation is financed by donors' grant aid. For the second category, financing for urban water supply and sanitation is financed by donors' and/or private sector involvement in the form of management contract, lease and concession mainly led by international and regional water business operators. However, for the third category of small/medium sized cities, the financial flows to local municipality water projects (middle of between mentioned above) are limited. (See the chart below)

Figure 27



The missing middle is emerged, because less attention tends to be paid by donors while the small and medium cities are difficult to be operated on its own or by private for the following reasons: poor capacity of the water utilities (e.g. (i) planning of capital investment and its disbursement and (ii) operation), smaller deal size, and credit risk of the utilities. Thus, it is "missing middle" in the financial flow into the African water sector and how to create a financing mechanism is a critical issue.

The typical case observed is AIAS in Mozambique. AIAS is established to provide the water supply and sewerage to small and medium cities, but struggling to obtain the finance.

This missing middle can also be observed in peri-urban areas, where many of illegal settlers make it difficult for water utilities to provide water and sanitation services. British nonprofit partnership between donors, academia and private companies, WSUP (Water Supply and Sanitation for the Urban Poor), is trying to introduce private sector know how by providing technical assistance to municipal utilities in medium sized cities.

In this regard, the main potential funding needs to be addressed by PPP include the following two groups of projects:

1st. group: Relatively large-scale projects which could attract international and regional large private players (mainly in urban areas)

2nd. group: Small, medium-sized projects which are not necessarily able to attract international and regional large private players (mainly in small town and semi-urban areas)

When PPP is discussed, we generally assume lease / affermage and concession type of PPP contracts for large-scale projects (i.e. the 1st. group projects). However, in case of Africa, attention needs to be paid also to small- and medium-sized projects (i.e. the 2nd. group projects)

where private sector utilization through the use of such contracts adopted for large-scale projects cannot necessarily be done. For this second group, therefore, private sector participation / involvement should be utilized in a much broader sense including the use of technical assistance and private sector financing. As the technical assistance, the case of Mozambique can be the example where Vitens-Evites provided technical assistance to FIPAG for the water project serving secondary cities. As for private sector financing, the case of K-Rep bank in Kenya can be the example where the micro finance institution (K-Rep bank) extends the loan to water service boards for small piped water projects, while the overall loan size was reduced by the subsidies based on the output-based aid. Thus, PPPs in Africa should be re-defined in a broader sense, not limited to private sector participations through lease / affermage and concession contracts for large-sized projects, but also include those through any form of private sector involvement such as technical assistance and lending from the private sector for small- to medium-sized projects.

2.3.5 Lessons learned from the past/ongoing PPP projects

(1) Impact of PPP projects: Various results with some improvement. Also, another role to support public sector's service delivery improvement

Implementation of PPP projects is not necessarily better off than the traditional approach (all responsibilities under public sector), but in some successful cases, the improvement was observed in the following aspects:

- Improvement of access expansion, mostly residential connection (Example: Senegal)
- Improvement of reliability of service (Example: Senegal, Gabon)
- Achievement of operational efficiency gains and lower tariff as a result (Example: Senegal, Gabon, Nelspruit in South Africa)

On the other hand, PPP scheme is not the final goal, but is more playing the role to help the public sector to improve the service in some cases. For example, in Johannesburg and some cities in Mozambique, the service was provided by management contracts. During this period, public sector (City of Johannesburg, FIPAG) gained the knowledge and the skills through the trainings or technical assistance, and when the management contracts are completed, the public sector decided not to proceed with another management contract and took over responsibility of providing the service. For these cases, we cannot conclude that the quality of service and efficiency of service delivery are better by public sector than private sector, but at least the

provided service level was improved compared with the past before PPP project, according to the interviews with stakeholders.

(2) Structure for private sector participation

The followings are the lessons learned to implement PPP projects.

a) PPP scheme: Affermage arrangement is relatively successful. However, investment appetite in water sector in Africa is recently low among international investors

The affermage arrangement appears to be relatively successful PPP scheme in the region. (The customer tariff policy and financing the development of the infrastructure by public sector's responsibility) According to Water Toolkit by PPAIF, the operator's income is defined in case of affermage and lease contracts:

Affermage contract: Affermage fee x volume of water sold – operating and maintenance cost
Lease contract: Revenue from customers – operating and maintenance cost – lease fee

Here, "Revenue from consumers" in the lease contract is "Tariff" times "volume of water sold". In this regard, the significant difference for operators in this equation is that operators' income is not affected by tariff and an operator can concentrate on improvement of the service which could be measured from volume of water sold; this seems to affect the success of PPP projects in water sector in Africa by affecting the performances of private operators. One of good examples is the case in Senegal. The affermage contract, in which the revenue level of private operator is determined only by its performance level, significantly improved water performance indicators, including access level, tariff collection level and non-revenue water. One of the significance of this contractual arrangement is that the revenue level of the private operator is not determined by the tariff level. This enabled private operators to concentrate on improving performance indicators. At the same time, the cost recovery in a gradual, socially acceptable manner are tried to be achieved. However, as discussed above, potential international private operators are recently reluctant to take the investment risk, thus it might not be not easy to find the potential investors even for the affermage arrangement.

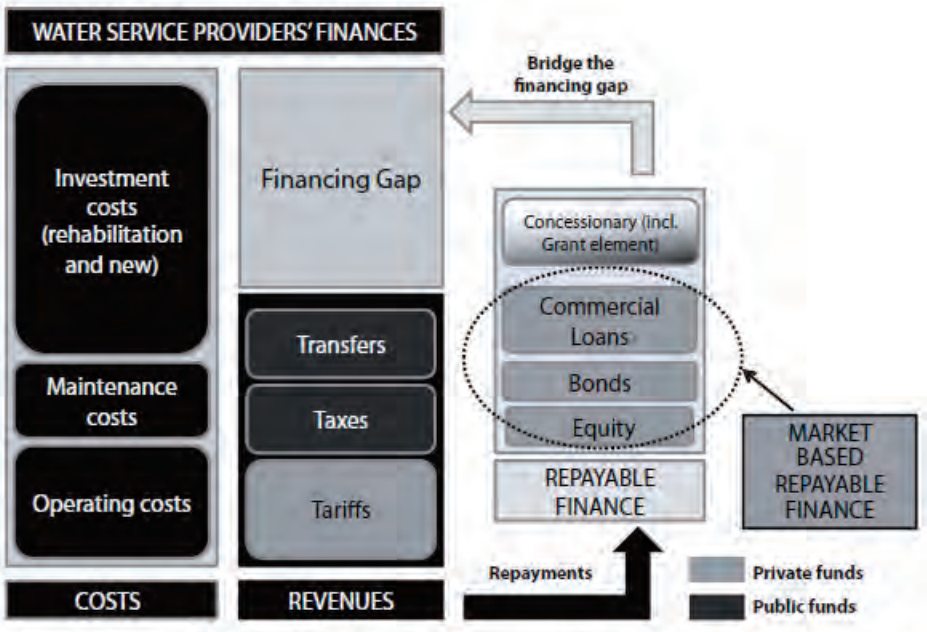
Difficulty of concession with private investing; Issue of ownership

- When we consider the issue of funding for water, we first have to bear in mind the strongly

public nature of water and the ultimate requirement for public ownership of water infrastructure. Since ancient times, people have been living by the water, namely rivers, ground water or lakes. Like air, water is an absolute necessity for living and, therefore, access to water has to be secured for all kinds of people, rich, poor, urban or rural. In this sense, water infrastructure is totally different from mobile phones or toll roads and is not suited for full privatization.

- Current literatures and interviews to people involved in water infrastructure, such as donors, private water service providers and investors, there seem to be a shared view that the ultimate ownership of water infrastructure should be in the hands of public. World Bank, in its review of PPP experiences in urban water sector in developing countries, states "The focus of PPP should be on using private operators to improve operational efficiency and quality of service, instead of primarily trying to attract private financing.[10]" OECD's report on "Innovative Financing Mechanisms for the Water Sector" further clarified the ownership issue of water infrastructure by defining "equity from private bodies" as "Repayable Finance".[11]

Figure 28 : Using repayable finance to bridge the finance gap



Source: based on OECD (2009), *Managing Water for All: An OECD Perspective on Pricing and Financing.*

[10] P8, "Public-Private Partnerships for Urban Water Utilities**,** A Review of Experiences in developing Countries", Philippe Marin, c 2009 The International Bank for Reconstruction and Development / The World Bank
[11] P31 "Innovative Financing Mechanisms for the Water Sector", Copyright OECD 2000

- The experiences in Africa support the arguments above. As for a series of urban water concessions awarded about 10 years ago, most of them led to early terminations. Even for the surviving concession in Gabon, the dispute between the government and the concessionaire, owned by a world leading water service provider, Veolia, is continuing on the responsibility of capital expenditures to catch up with rapidly growing demand for urban water services.

- This Gabon debate provides us with a great example of the ownership issue. The government of Gabon is accusing the concessionaire for not having to invest enough, while the concessionaire is asserting that it had invested more than originally planned and the unexpected pace of urban population growth attributed to the cause of failure in achieving some of the performance targets. However, the fundamental cause of confrontation stems from difference in the perception of investment responsibility. The government of Gabon believes that the concessionaire has to invest how much ever amount of money to provide water access to the rapidly increasing urban population. On the other hand, the concessionaire regards its involvement in Gabon as purely a business venture with limited time frame. Therefore, Veolia believes that it has no obligation to make certain investments if it is not possible to be paid back within the remaining concession period. This is a natural view from a private investor because, at the end concession, the concessionaire has to transfer all the assets to the government. Considering a very long payback period required for a typical water infrastructure investment, such closed end nature of concession contract makes it very difficult for the concessionaire to invest in the later stage of the concession period.

Figure 29

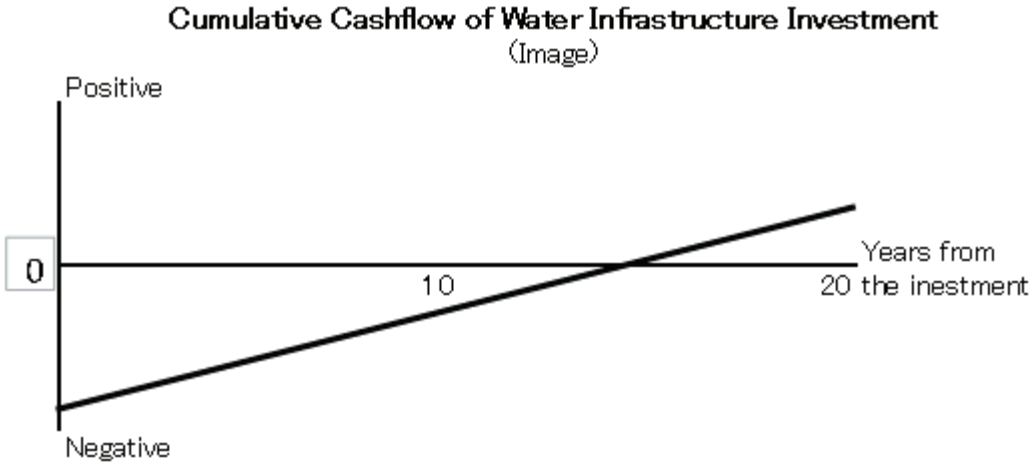
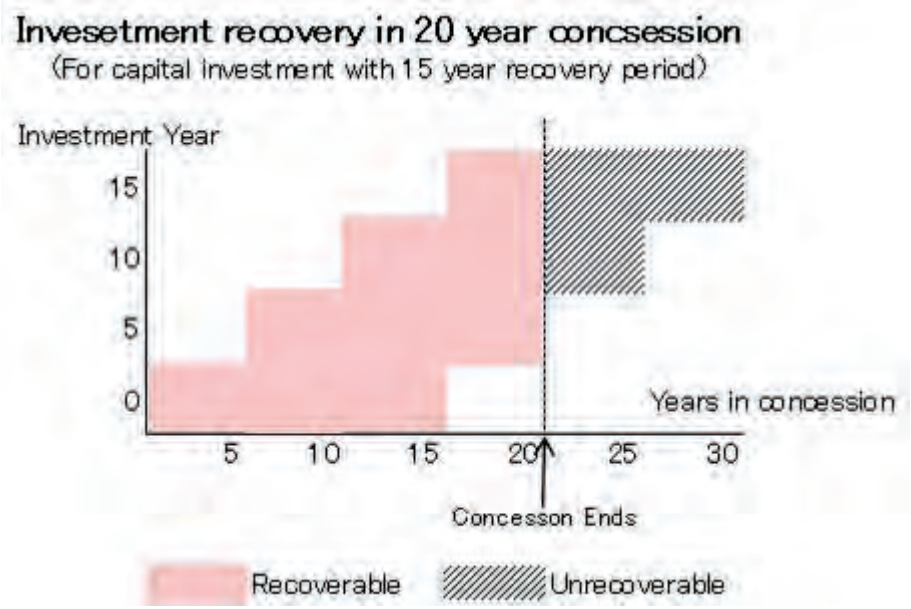


Figure 30



- Unlike usual business activities where perpetual private ownership is protected by law, water infrastructure is a public property not only in developing countries but also on developed ones. Even if a private concessionaire invests equity in urban water distribution networks, it does not mean that the private concessionaire holds a private ownership of such because the ownership of facilities is to be transferred to the public sector at the end of the concession period. In this sense, private investors in the water concession are in a similar situation as the lessee of a certain property, which is entitled to use it for a certain period of time. Any additional investments that the lessee made to the property will have to be recouped during the term of the lease. Likewise, any investments that private concessionaire in water PPP made, will have to be recouped during the term of the concession.

- As often quoted saying goes “nobody ever washes a rental car”, it is not realistic to expect the private concessionaire, who is in charge in water infrastructure “only for a couple of decades” to respond to all the changing demand for water service. The investment burden is even higher in African urban areas, where population growth has been much higher than most experts forecasted. The response to the exploding demand for urban water requires true ownership and century-long commitments. The Study Team would like to mention the story of Tokyo, which experienced a huge population growth from little over 1 million in 1876 to 12 million in 1985. In response to more than tenfold increase in residents, Tokyo

metropolitan government took a series of century-long initiatives. For example, it started fostering Water Reserve Forests in the western part of Tokyo in 1901 to prepare for the increase in water demand for the centuries to come. Such ultra long span projects made it possible for Tokyo to host 15 million daytime populations today. For such a century long project, only the government can be responsible.

- Because of this issue of ownership, the Study Team comes to share the consensus among the African governments and global donor community, “the major water infrastructure investments should remain in the responsibility of the public sector and private players should be employed as operators to enhance efficient management”. The Study Team would like to examine each funding options based on the view point that all the private funding is to be paid back with profit.

b) Scope of PPP projects: Sewerage is difficult to be covered in PPP

Sewerage is one of the sub-sectors which cannot be easily covered by PPP projects. It is not always easy to collect sewerage fees from users, and they are collected together with water tariffs or electricity tariffs. At the same time, sewerage facilities require huge investments. Therefore, except some countries with higher income and higher demands for sewerage, such as Egypt, it is not easy to formulate PPP projects for sewerage.

On the other hand, there are some countries where the water supply and power supply are combined in the concession contract. While it can bring into the issue of the cross subsidy from the power segment to the water segment, it has the possibility for a project to be financially viable. However, the results are mixed and change over time, and are not always successful. Based on these, at least, it may be said that we need to consider relevance and feasibility of combined project such as consolidation of water supply and sewerage in specific area at the same time when we plan and set up PPP projects.

c) Key performance indicator: Reliable baseline setting and realistic KPI are important

For both parties (private and public), it is important to select and agree on the appropriate types of KPI in advance. However, more importantly, (i) the determination of the appropriate level of the baseline, (ii) understanding between both parties and (iii) the bidding based on these baselines and realistic KPI will be critical to implement a project in order to avoid the future conflict. If the baseline is different from reality, KPI proposed in the bidding and the cost

analysis by a bidder will be meaningless. This discrepancy will make the both parties unsatisfied with the performance of project in terms of delivered service and profitability. At the same time, it is important that there is flexibility in the contract that the baselines and the targets in KPI could be revised and this will be conducted in the contract in transparent and flexible manner. For this process, establishment of the monitoring methodology and implementation and appropriate information sharing will also be required. For example, in Gabon, the population growth is faster than the forecast and expansion of the facility is necessary along with this population growth and the operator and government are under negotiation regarding the additional investment which was not expected.

For example, the management contracts in Uganda did not achieve the target in performance indicators and based on that, we could argue that the management contract did not bring the satisfactory results. However, when the Study Team compares the performance indicator before and after the management contracts, the indicators after the management contracts are higher than the ones before. From this fact, unless the appropriateness of the targets could be examined (whether it was the feasible level based on the accurate baseline information), the impacts by PPP projects cannot be concluded.

d) Currency fluctuation risk: It is not the biggest issues compared with other investment environment

There were not necessarily many operators who pointed out the currency fluctuation risk as the biggest issue (especially if there is strong banking sector in the target country), or the contracts which had to be terminated due to the currency fluctuation risk. However, there was the single case that Development Bank of Southern Africa extended the loan to the new water board in Malawi, which was defaulted mainly due to the currency risk. The project was successful in terms of turning the water board from the negative cash-flow to positive cash-flow in 3 months after the loan disbursement, but the loan went to default in the end after the depreciation of the local currency by 50%, while the loan was denominated in USD.

e) Strong domestic banking sector, which can provide medium- and long-term money to the water projects, will be helpful for water service providers

Rand water in South Africa receives the finance from domestic banks in the country. In addition, three concessionaires and six Régies in Morocco had borrowed long-term loans from local private banks in order to invest in wastewater treatment plants. The availability of the medium,

long term finance in the domestic financial market will be of help for water service providers regardless of private operators, water boards and/or municipalities.

f) Credit enhancement measures will be helpful for water service delivery by financially weak entities (e.g. domestic credit guarantee mechanism)

The water service providers in urban area tend to be financially strong compared with the ones in small and medium sized cities. For example, the municipalities or smaller water boards in South Africa have difficulties to borrow the money from the banks, while Rand water (the largest water board in South Africa) can borrow the money from private banks without problems. This difference arises due to the different creditworthiness between municipalities and/or water boards. If any credit enhancement measures are in place, it will be of great help for those financially weaker entities.

g) Economy of scale and transaction cost: Small project has high transaction cost relative to the benefits; some TA will be helpful to solve this

Financial cost for structuring scheme, credit analysis, legal documentation and monitoring weights relatively heavy on smaller size of PPP projects (disadvantage of small scale). This barrier prevents private participation in water business of small cities and rural areas. One solution for this is to subsidize financial and/or legal cost of small projects, and another is to bundle some of small projects by SPV scheme and to finance them through the special entity. These solutions could also be provided by appropriate technical assistance by donors.

h) Awareness raising program for communities to deepen understanding significance of water PPP and the perception of paying tariff to public services is necessary to promote PPP in water sector

In South Africa, the water sector is politically difficult for the private sector to be involved. This is because there is the perception that the access to water is the basic human rights; therefore it needs to be for free of charge or the private sector should not make the profit out of this. In this context, if water PPP projects need to be promoted, the following measures are necessary: the awareness raising program for communicates to facilitate understanding toward the significance of private sector involvement and the perception of paying tariff to public service.

i) Incentive measures to pay tariff willingly and to expand network are necessary to

promote PPP

There exist people who would like to have benefit of water supply system if the initial cost and tariff level is within their income capacity. This is even true with poorer countries and communities. Therefore it is useful and required to use some measures such as output-based aid mechanism (ex. GPOBA[12]), prepaid water meters and the bundling of utility bills to strengthen the viability of the projects. However, it requires extra cares to obtain public understanding and prepare social safety net, since there was the lawsuit against installment of the prepaid meters claiming possibility of human right violation (deny the access to water).

j) Not only funding but more technical assistance is necessary

The issues discussed above a) to i) show that shortage of funding is not only the issue, but project structuring and its environment behind of funding shortage are also the necessary conditions to be satisfied to promote PPP in water sector in Africa. Therefore, the assistance from international donors is desirable not only by providing funding, but more importantly the technical assistance in these areas will contribute to promotion of PPP projects in water sector in Africa.

[12] The Global Partnership on Output-Based Aid. For the details, please refer 3.3.2.(1) b) iv).

3. Funding scenario for promoting water PPP in African countries

There are two types of PPPs in African water sector, large and small transactions. Large transactions have a potential for attracting international water service providers and small transactions are to be carried out by local players. As the Study Team considers the funding scenario for water PPP in Africa, the Study Team would like to analyze the funding issue based on these two categories, namely i) water utilities for large cities/large BOTs (Large transactions) and ii) water utilities for small cities (Small transactions).

Figure 31 : Transaction types and current funding sources

	Type	Funding needs	Current funding sources
Large Transactions	BOT	Construction cost of plant or other facility	Grant/Soft Loan/ECA (Sudan) Domestic Banks(South Africa)
	Large utilities	Investment in plant, distribution or connection	Grant/Soft Loan Domestic banks (Morocco)
Small Transactions	Small utilities	Investment in plant, distribution or connection	Grant/Soft Loan

3.1 Overview of financing to water sector in Africa

Our field study revealed that investment in water infrastructure in Africa is mostly financed by public funds, such as grants/soft loans from donors and public spending. Even for PPP projects, private financing has been utilized in a minimal way. While there had been a series of concession contracts and a handful of BOT projects that brought in equity investments from private sector in the past, private investors from developed countries mostly retreated due to the failures. Surviving urban PPPs in African counties rely on public funding and user charges for investments.

Rare cases of private financing are concentrated in wealthy countries, such as Morocco and South Africa, where private water operators are borrowing from domestic commercial banks to finance capital investments. For example, three private water service providers in four largest cities in Morocco borrowed long term domestic currency loans from local banks.

While several cases of sub-sovereign lending to water asset holding companies have been

identified in South Africa[13] and Senegal, most countries still depend on grant aid and soft loans from donors for funding needs of the water infrastructure.

As for the foreign borrowing, the only case was identified in a bulk water BOT project in Sudan but the credit risk was fully covered by export credit agencies from Europe and Asia. The similar arrangement can be considered for future BOT projects but not many BOT projects are currently planned for African water sector.

Water PPP in semi-urban areas are not emerging in major scale but some countries introduced privately-managed but publicly-owned company models. Some of them in wealthy countries, such as Morocco, are borrowing from domestic banks. Also, there are innovative financing arrangements in semi-urban water sectors such as Philippine Water Revolving Fund for local water utilities and combination of micro-finance and output-based aid for the financing of water connection costs.

Figure 32 : Funding options for each category

		Tax / Donor	Domestic Debt	Foreign Debt	Equity
PPP in urban water sector	BOT	◎	○	○*	○
	Large water utilities	◎	○	△	○
PPP in semi-urban sector	Small and medium sized local water utilities	◎	△	×	×

◎Major Source ○Transaction happened △Possible but not happened yet ×Difficult

*For a project in Sudan, sovereign guarantee was needed.

3.2 Proposed funding scenario for water PPP in urban water sector

The dominance of soft loans and grant aids is due to the lack of bankable projects in water PPP in Africa. Bottle necks for water PPP projects in Africa are summarized as follows.

- Lack of enabling environment including legal and institutional framework, PPP and water sector policy, appropriate tariff level, and people's willingness to pay
- Lack of favorable political climate for PPP

[13] TCTA is now borrowing from EIB or other donors without a formal guarantee from the government of South Africa.

- Lack of pioneer projects (success stories)
- Lack of capacity of local water utilities
- Lack of debt mobilization / credit enhancement measures

In this section, we would like to examine existing donors' efforts on the abovementioned issues in Figure 33 in 3.2.1 and explore options for three DFIs.

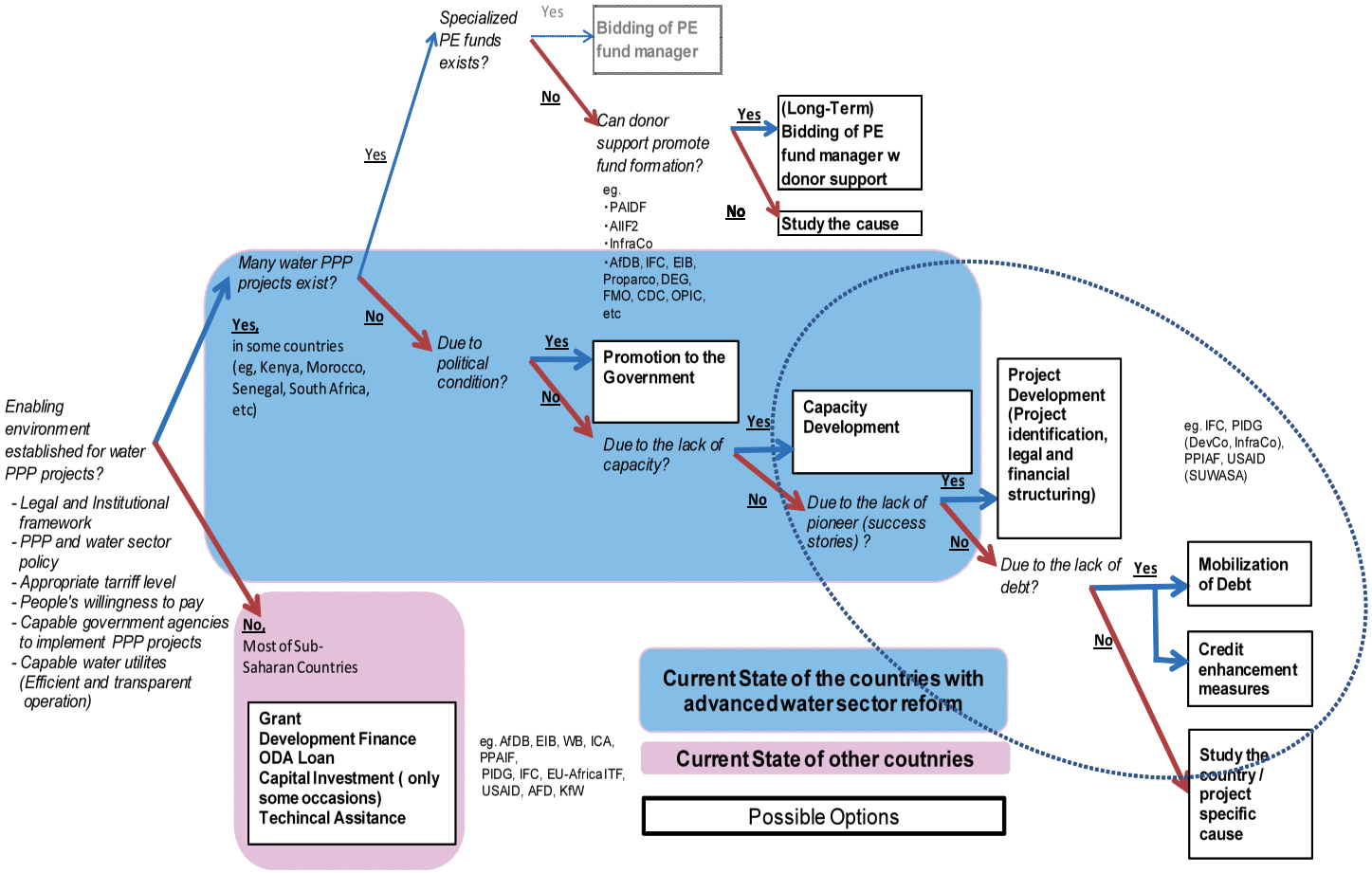
3.2.1 Existing Donors' initiative

Against the abovementioned bottlenecks, donors and DFIs have been taking actions. The figure 33 is a flow chart for a promotion of PPP in African water sector. Top-end is a state where many PPP projects are formed and a large amount of private funds are invested. None of African countries had come to this stage yet.

Some countries, in upper blue area in Figure 33, had already made progress in the water sector reform. Such countries include South Africa, Senegal, Morocco and Kenya. As a result of the reform, concession in water services was granted to private operators in South Africa, Senegal and Morocco but no new PPP projects are planned in those countries. In Kenya, corporatization of public water utilities has been achieved but any initiative for private involvement has been considered. For wealthy countries such as South Africa and Morocco, a large part of bottleneck is in the political conditions where the issue of private involvement in water is being politicized by politicians, labor union and other vested interests.

Most Sub-Saharan African countries, in lower red area in Figure 33 do not have modernized water system, in terms of legal and administrative system, capacity at water utilities and people's willingness to pay. Those counties shall continue to be recipients of assistance from donors for modernization of the water sector and will not be the target for PPP projects or market based borrowing.

Figure 33 : Possible options and existing donor initiatives for PPP in urban water sector



(1) Technical Assistance and grant aid for the creation of enabling environment

In most countries in Sub-Saharan Africa, the first condition of "enabling environment" has not yet established. For these countries, many donors have been providing technical assistance programs and/or program loans to water sector reform, policy, strategy and regulation preparation, as well as capacity development of related governmental organizations.

(2) Promotion of PPP: currently not carried out by many donors

On the other hand, even in countries with relatively advanced water sector reform, such as South Africa, Morocco and Kenya, not many new PPP or market based borrowing is taking place due to political resistance. While South Africa had several successful PPP cases, current political sentiment against private involvement in the water sector makes it very difficult for new project to emerge. In Morocco, while three private operators are successfully distributing water and electricity for four largest cities in the country, no new concession is being discussed. In Kenya, water sector reform under Water Act 2002 clearly allows for private sector participation[14] but no concession has been granted.

Despite the lack of new PPP projects, not many donors are actively promoting water PPP to the governments in Africa. Due to the high profile failures and political resistance, many of donors and private investors seem to have lost their passion in private investment in African water. Frequently quoted World Bank's report on urban water PPP states, "The focus of PPP should be on using private operators to improve operational efficiency and quality of service, instead of primarily trying to attract private financing.[15]"

The exception is International Finance Corporation, which is still trying to promote PPP in the water sector in Africa. Its advisory group is now assisting the government of Rwanda on the potential BOT projects for a bulk water plant. Also, IFC is advising the government of Mozambique on the potential divesture of the share of public water service provider, FIPAG, while a private ownership is not considered as an end but as a mean to improve the service.

(3) Mobilization of debt

While there are a lot of donor initiatives that can provide loans and equity to water PPP projects

[14] P9, Urban water financing concept paper, Water and Sanitation Program, Sept.28, 2009
[15] P8, "Public-Private Partnerships for Urban Water Utilities**,** A Review of Experiences in developing Countries", Philippe Marin, c 2009 The International Bank for Reconstruction and Development / The World Bank

in Africa, the actual usages of commercial-based finance facilities or equity investments are limited. IFC and PIDG, both aim at private sector, have had very limited water-sector projects in the past. EIB has been supporting water sector projects, however, mostly through providing concessional loans to public sectors. AfDB has both public-sector windows for sovereign borrowers and private-sector windows for non-sovereign borrowers (including municipalities and public corporations) but most of the projects to date have been in the public sector.

However, several cases of market-based lending to sub-sovereign entities or BOT projects exist or are being examined. Also while not investing in water sector in the past, the funding schemes to channel private funds to infrastructure projects in Africa have been established with the help of donors.

a) Sub-sovereign lending

During our field trip, the Study Team had identified the case of sub-sovereign lending provided by donors in South Africa and Senegal. As these two counties largely differ in terms of economic development, the donors' rationale behind extending credit without sovereign guarantee is also very different. For South African water asset holding company, donors provide sub-sovereign loans because they are comfortable with the creditworthiness of the borrower entity and the country. In Senegal, the donor's purpose is to provide the water asset holding company an opportunity to experience for market based borrowing.

Agence Française de Développement (AFD), who has been supporting for infrastructure development including water sector extensively in Africa, is currently providing non-sovereign loans to SONES in Senegal. Although the interest rate for the SONES is relatively cheaper than the commercial-based interest rate, the contractual arrangement is the same with the commercial-based arrangement. AFD mentioned that AFD was providing the opportunities for SONES to get acquaint with the procedures that they would have to be familiar with to mobilize the commercial funding in the future. AFD believes that this kind of step-by-step approach would be very important for African countries to get used to the arrangement including the settings of cost recovery tariff as stipulated in the contract.

b) Market-based lending and equity investments to specific PPP projects

In our field study, the Study Team had identified two potential BOT projects[16] that are seriously

[16] Both projects were disclosed to the study team on confidential basis.

considering market-based borrowing and/or minority equity participation. However, the risk profile of financing is similar to sovereign lending because both projects were guaranteed by the central governments of the host country. Track record of water BOT projects is not many in Africa. (See 2.3 Figure 20)

c) <u>Creation of infrastructure funds for PPP projects</u>

There are three donor assisted funds specializing in African infrastructure, two private equity funds, Pan-African Infrastructure Development Fund (PAIDF) and African Infrastructure Investment Fund 2 (AIIF2), and one debt fund, Emerging Africa Investment Fund (EAIF), revealed that all of them consider water as a very important area but have no track record of actual investment. For existing funding mechanisms in Africa, please see Appendix 2.

3.2.2 Suggested actions for three DFIs (USAID, AfDB and JICA)

Based on the Figure 33, we concluded that donors and DFIs have been addressing key issues already but new PPP projects have yet to be materialized. What is worse, due to the high profile failures in the past and political sentiment against private involvement in the water sector, the momentum toward PPP is waning. To revitalize the African people's perception toward PPP, success stories are needed at first. Therefore, USAID, AfDB and JICA should concentrate its efforts on producing success stories and subsequently increasing the number. Finally in reaching the critical mass of bankable water PPP projects in the region, more enhanced funding mechanism such as private equity fund dedicated for water PPP should be considered in the long-term.

(1) Short-term: Creating enabling environment for water PPP and producing Good practice of the funding

In order to identify financing opportunities and demonstrate the good practices of water PPP in urban water sectors in sub-Sahara Africa, three DFIs should look for a potential project in a country with relatively developed enabling environment. Successful introduction of private funding should send a great signal for other governments and water utilities that there is actually an alternative to public funding for water sector in Africa.

At the same time, in order to promote a candidate project steadily, three DFIs should address the policy and intuitional issues through TA and development policy lending programs to encourage

the host countries to improve business environment for water PPP (to be described in 3.2.2.(4) a)).

While identifying the financing opportunities for a candidate project, three DFIs need to bear in mind the following issues, in particular from the perspective of mobilizing international funds:

a) Investment grade credit raging
b) Stable foreign exchange rate
c) Strong local banking sector

For water utilities in Africa, borrowing from international banks or issuance of bonds in international capital markets would be very difficult unless the central government provides guarantee and ECAs from developed countries provide counter guarantee, as was the case of BOT project in Sudan. In order to achieve direct access to international banks or capital markets, without support of third party guarantees, governments of African countries have to meet several additional conditions as follows:

a) Investment grade credit rating

For international banks and institutional investors, investment grade sovereign rating, BBB- or higher, is a first test when they consider new loans or bond purchases. There is a big discrepancy in the default probabilities between BBB and BB and achievement of an investment grade means an entry to a club of “creditworthy nations”.

Figure 34

Moody's sovereign rating characteristics

Aaa – Exceptional economic, financial and institutional strengths resulting in unquestioned access to finance. No shock can conceivably disrupt payment capacity.

Aa – Very high economic, institutional or government financial strength and no material medium-term repayment concern.

A – High economic, financial or institutional strength and no material medium-term repayment concern.

Baa – At Baa, a government would have the capacity to sustain a coherent economic policy framework and avoid any near-term debt repayment problems if confronted with a severe shock to public finances.

Ba – No clear and present repayment concern and tangible adjustment capacity in a context of potentially severe economic, financial or political shocks.

B – One shock away from default, and/or material concerns about willingness to pay.

Source : "Rating Methodology", www.moodys.com, September 2008

As the table below indicates, very few African countries have investment-grade sovereign ratings and it takes a long process of economic developments to improve the rating. Therefore, it would be difficult to attract funds from international banks or capital markets and, consequently donors will have to be a major supplier of funds to African water PPPs in the short term.

Figure 35

Credit rating of government bonds (Foreign Currency)

	Moody's	Outlook	S&P
Botswana	Aa3	STA	A-
South Africa	A1	STA	BBB+
Tunisia	Baa1	NEG	BBB-
Morocco	Baa2	STA	BBB-
Egypt	Ba1	NEG	BB
Gabonese Republic			BB-
Angola	Ba1	STA	B+
Cape Verde (Republic of)			B+
Mozambique (Republic of)			B+
Republic of Zambia			B+
Senegal (Republic of)			B+
Uganda (Republic of)			B+
Burkina Faso			B
Cameroon (Republic of)			B
Ghana (Republic of)			B

Moody's as of June 21, 2011. S&P as of June 30, 2011 [17]

b) Stable foreign exchange rate

International bank loans and international bonds are usually denominated in US dollar or Euro. If a borrower country's currency fluctuates against dollar or Euro, it not only scares off foreign lenders / investors but also poses a significant financial risk to local borrowers because the debt service amount in domestic currency may suddenly increase. Because water service has only domestic currency revenue, devaluation of currency may have fatal impact. Many water and other domestic infrastructures PPP were in fact badly damaged in Asian currency crisis in late 1990s and Argentina crisis in 2002.

Conditions for stable foreign exchange rate is similar to the ones for investment grade credit rating, such as maintenance of fiscal and current account surplus and low inflation rate.

c) Strong local banking sector

To carry out the PPP project by mobilizing funds internationally, an important prerequisite here is to investors have confidence in the stability of the financial sector in the host country. The existence of the sustainable financial institutions having sufficient capacity to manage the

[17] www.moodys.com, www.standardandpoors.com

project account and to handle international transactions is also essential.
Also, equity investors would benefit from local borrowing to leveraging its investments. Conditions for having the strong local banking sector is to have the sound and stable financial system, including the appropriate regulations and the strong banking supervision body, and also institutional strengthening of the local banks or financial institutions.
In our field survey, local banks in South Africa and Morocco had already started providing long term loans for private water operators.

(2) Medium-term

Built on the experiences in short-term, three DFIs should make efforts of increasing numbers of the good practices of water PPP in urban water sectors, such as setting up a platform consisting both public and private players, to share the relevant information to identify and/or develop the appropriate water PPP projects. Another idea is that three DFIs make periodic research on potential projects that may mobilize private money replacing ODA loan and/or grant if appropriate TA supports including managerial legal and financial advisory are given by donors. In these processes, the possibility of creating of country and/or regional funding mechanism, such as a private equity fund and revolving fund etc. should be explored.

(3) Long-term

If certain form of support is proven to be very effective and considered applicable to a large pool of potential beneficiaries, a permanent funding mechanism, such as a private equity fund, a specialized finance company or revolving fund, should be created (NOTE: Issues to be considered for such permanent funding mechanism are examined in 3.2.3).

(4) Other actions

In addition, three DFIs should take following actions.

a) Technical assistance

As mentioned in 3.2.1 (2), not many donors are engaged in awareness raising activities for PPP in water sector, so that the Study Team recommends three DFIs to put special emphasis on this issue.

On top of this, given the current state of African water infrastructure, where the most of capital investments are carried out by public bodies and the most of the funds are provided by donors and three DFIs would have to start from creation of the enabling environment for bankable projects and building the capacity of the relevant organizations by providing technical assistances and/or through program loans. For this purpose, the following technical assistances should be considered.

i) TA for water sector reform, policy, strategy and regulation preparation

One of the advantages of the PPP approach is that it allows for unbundling the key functions of policy formulation, regulation, financing, asset ownership and service provision. It enables to establish contractual relations between public and private partners which enhance the overall accountability framework of the sector. It is pointed that successful PPPs have been designed as part of comprehensive sector reforms to improve the performance of public partners with regard to planning and implementation of system extensions, tariff setting, and monitoring of service quality, as well as mobilizing financial resources.

Main purpose of the TA is to support the government to prepare clear policies and to clarify the short and medium term commitments and strategies. For private operators, clear policies to promote PPP and strong public commitments are the reasons to participate in the PPP projects. Also, cost recovery strategy is one of the most important factors, because tariff adjustment and payment from governmental agencies are essential for successful water PPPs. TA for preparation of cost recovery policies including tariff adjustments, strict disconnection procedures, social connection program, etc. will be helpful to promote PPPs smoothly. Water sector reform is the suitable tool to promote PPPs by defining the roles and responsibilities of each related organization and shown their clear policies and strategies above mentioned. South-South cooperation between the countries which are implementing PPP promotion and the countries which wish to do so will be an effective way of the TA. Assistance for preparation of Water Master Plan including possibilities of introduction of PPP and appropriate investment plan will be helpful for PPP strategies and projects identification. South-South cooperation between the countries which are implementing PPP promotion and the countries which wish to do so will be an effective way of the TA. For example, Privatization and Regulatory Reform Technical Assistance undertaking by World Bank for Niger is a good reference for deployment of the successful Affermage PPP model of Senegal into the same western African region.[18] Also,

[18] World Bank "Implementation Completion and Results Report to Republic of Niger for a Privatization and Regulatory Reform Technical Assistance Project" June 2007 and PPIAF "Reforming Urban Water Utilities in Western and central Africa: Experiences with Public-Private Partnerships Vol.2: Case Studies" June 2009

the PPP models in Cote D'lvoire[19], South Africa and Morocco will be good examples for other African countries. Assistance for preparation of Water Master Plan including possibilities of introduction of PPP and appropriate investment plan will be helpful for PPP strategies and projects identification

ii) TA for awareness raising programs of water PPP for policy maker, and the public

In order to promote water PPPs with cost recovery policies, social acceptance for privatization and paying water tariff are very important, because most of all politicians would not like to introduce PPPs and raise water tariff against their residential will. For example, in South Africa, there is the perception that the access to water is the basic human rights; therefore it needs to be for free of charge or the private sector should not make the profit out of this, and it makes political difficulties for private sectors to be involved in the water sector. We can see the same situations in some other African countries and the perception of free of charge should be changed in those countries by awareness raising programs for communities. It is interesting to note that a number of domestic consumers in urban and semi-urban areas have a significantly higher willingness-to-pay as evidenced by their use of private water tankers which deliver water to them at higher tariffs. On the other hands, domestic consumers who have alternative unimproved free water sources (rivers, ponds, etc) in rural areas have lower willingness-to-pay. Therefore, it should be careful to plan awareness raising programs depending on each situation.

iii) TA for preparation and implementation of social connection programs

Social connection programs have been a key feature of most successful PPPs in the African region. Because it enables to achieve both increase revenue by increase of connection and access expansion through poor household connection. In case of support social connection programs, financial assistance for subsidy to connection charge will be required. Output-based aid mechanisms (e.g. GPOBA) could be particularly useful in poorer countries and/or poor urban communities, where the willingness and ability to pay are often overridden by prohibitively high connection fees.

iv) TA for capacity development of related governmental organizations to realize PPP projects

It is noted that a significant number of projects and implementing agencies in Africa lack the requisite capacity for water PPPs. The government agencies are often ill-equipped to

[19] In fact, the experience of PPP in Cote d'lvoire had great influenced Senegal

successfully negotiate PPPs. Therefore, TA for capacity development of related governmental organizations will include strengthening projects implementation capacity of PPP framework such as enforcement of PPP framework, timely disbursement of public investment, and tendering assistance. It is also important to support for establishment of a dispute-resolution mechanism among stakeholders and regulatory tools (not only establishment of a regulatory body, but also regulation by contract, independent system for performance monitoring). For more enabling environment, TA for policy, strategy and regulation preparation described in ii) in this section) shall be done before or at the same time.

v) TA for capacity enhancement of public water utilities

TA for enhancement of public water utilities, which will be financed by private or transferred to a private operator, is very important for a large transaction. The successful PPPs involve local private operators managed by nationals and owned by local interests and most of PPPs continue to hire employees who have worked at former public utilities. The base line data of key performance indicators which shall be provided to the bidders are generally from the utilities and provision of accurate data will contribute to initial stage of PPP projects. The TA will include the following scopes.

- To assist operation and maintenance of water facilities (including preparation of operational manuals, OJT, etc.)
- To assist reduction of NRW/UFW
- To assist improvement of billing and collection efficiency
- To assist water quality control
- To assist strength of Information Management System
- To improve human resources management
- To assist collection and analysis of performance indicator

vi) TA for credit enhancement

Water utilities prefer money from their governments and donors simply because those are much cheaper than the ones from financial market while the market shows unwillingness to make loan to them because of their low credibility that explains high financing cost. In order to exit from this negative spiral and to enhance their creditworthiness, donors should support developing countries to consolidate institutional framework such as credit guarantee system and currency risk mitigation mechanism for PPP type projects.

vii) TA for project development

Donors should provide water utilities appropriate knowledge and know-how to improve their operational and managerial soundness in order to reduce the financial cost. Also it may be useful for donors to offer financial and legal advice when water utilities try to finance from markets, to structure schemes that enhance their credit reliability, to help select their reliable business partners and to negotiate with private participants.

Figure 36 :Proposed TAs for PPP in urban water sector

Term	Goal of financial scenario	Possible TAs
Short-term	To demonstrate successful urban water PPP projects and improve enabling environment	➢ Water sector reform, policy, strategy and regulation preparation including promotion of cost recovery ➢ Awareness raising program for communities to facilitate understanding toward the significance of private sector involvement and the perception of paying tariff ➢ Preparation and implementation of social connection including examination of utilization of output-based aid mechanism ➢ Capacity development of related governmental organizations to realize PPP projects including PPP projects identification, preparation of PPP framework including financial structuring and legal advices, and tendering assistance ➢ Enhancement of technical and management capacity of the target public water utilities ➢ Credit enhancement of the target public water utilities ➢ Project development for legal and financial structuring
Medium-term	To increase successful urban water PPP Projects and improve enabling environment	
Long-term	To establish the Africa Water Fund	➢ Enhancement of technical and management capacity of water utilities ➢ Credit enhancement of water utilities

In addition to these proposed TAs, it is suggested to utilize the grant facilities provided by the African Water Facility (AWF) managed by AfDB[20], as well as the USAID/PPIAF facility[21].

[20] AWF provides grants to 1) strengthen water governance, 2) investments to meet water needs, 3) strengthening the financial base and 4) improve water knowledge for the amount from 0.5 million to 5 million EUR.

[21] USAID provides grants (total 3 million USD) targeting toward the water sector in Africa, to cover wide range of potential support that facilitate private involvement in the financing, ownership, operation, rehabilitation, maintenance, or management of infrastructure services, including water and sewerages. For the details of the PPIAF, please refer to the Reference Information

b) Project screening

When three DFIs identifying the potential projects, three DFIs need to screening them very carefully for example based on the following criteria.

i) Screening criteria

In the short and the medium term, three DFIs' involvement in the water sector in Africa should be on single project basis. Therefore, the selection criteria for each individual project must satisfy all the rules on equity investment and lending for three DFIs.

On top of this, three DFIs should make sure if the enabling environment exits for commercial borrowing or commercial level equity offering. Conditions for enabling environment are included in the table below;

Figure 37 : Preconditions for the creation of bankable water projects[22]

<table>
<tr><td colspan="2">BOT Project
for specific facilities (Bulk water, wastewater treatment, transport, etc)</td><td>Concession of water utility operator</td></tr>
<tr><td colspan="3">Legal framework, organizational capacity and contractual arrangement</td></tr>
<tr><td colspan="3">Credit enhancements for financially weak entities
(Investment/credit insurance by ECAs, Credit risk guarantee from USAID/DCA/GuarantCo)</td></tr>
<tr><td rowspan="3">Strong offtake contract
(Contract with creditworthy utilities that;
Operate in consistent regulatory framework including appropriate tariff setting
Operate in autonomous, efficient and transparent manner, and
Serve for willing-to-pay users)
Or</td><td colspan="2">Consistent regulatory framework including appropriate tariff setting</td></tr>
<tr><td colspan="2">Autonomy of utility operations</td></tr>
<tr><td colspan="2">Efficient and transparent operation with timely disclosure and external audit</td></tr>
</table>

[22] Under the concession contract, the private sector operator is responsible for both operation and investment. Through the BOT contract, the private sector takes charge of construction, financing and operation of the specific water facilities (such as water purification and wastewater treatment plants). In other words, through the concession contract, the private sector operator is in charge of the delivery of overall water services, whereas, through the BOT contract, the private sector is only responsible for providing the services in relation to the specific water facilities.

(Central government guarantee for the obligation of the utilities)	**People's willingness to pay**
Strong sponsor (Ability/willingness to invest equity, raise debt and operate)	**Strong sponsor (in case of concession)** (Ability/willingness to invest equity, raise debt and operate)
Strong EPC contractor	**Well trained personnel**
Strong operator	**Economy of scale**

At the same time, three DFIs should make sure that their involvement provides not only funding but also additional value to the water sector in the country. Examples of such additional value include but not limited to;

i. Serving as a catalyst or a credit enhancement for private funding
ii. Providing financial discipline to the water utilities, as well as regulatory agencies by demanding sound financial management for timely debt service
iii. Supporting Japanese and other foreign water service providers to bring in the technical and managerial expertise
iv. Supporting the creation of sustainable institutional and market arrangement to enable improved service to the communities

ii) Financial instruments in financial structuring

a. Debt

As mentioned in 3.1.1, most of the water infrastructure investments are now financed by the concessional loans to public entities provided by donors. The logical and realistic next step is to introduce private and market-based borrowing and three DFIs should support the programs for such purpose.

One way to do so is by providing matching finance with local commercial banks but with lower interest rate and/or longer tenor.

Another way is to provide subordinated debt or quasi-equity as credit enhancements to other lenders.

b. Equity investment in concessionaire of the water infrastructure

Concessions of the urban water infrastructure exist in some African counties but, due to the several of high-profile failures, there is no concrete plan for the new concession[23].

One of the biggest problems for most of African urban areas is its rapid pace of expansion and lack of proper urban planning. Such trend requires the concessionaires to constantly invest in expansion of water production capacities, water distribution, sewage networks, and wastewater treatment capacities. For this reason, it is very difficult to implement the concession arrangements of a whole urban water infrastructure. As discussed in 2.3.5 (2) a) "Issue of ownership", dispute over Gabon concession between the government and the concessionaire is exactly on the responsibility of new investment.

For this reason, the Study Team believes that there will not be many new concessions for the time being in Africa.

c. Equity investment in BOT

While the Study Team had identified various kinds of potential BOT projects, most of them are still in conceptual stage and the prospect for materialization is not high. At this point, only one bulk water project in Sub-Saharan Africa is actually being developed by private investors and multiple donors' private windows are seriously considering lending and/or investing in minority share[24].

One of the reasons for the absence of active BOT project is the high cost of equity to be provided by private parties. Given the public nature and the need for public ownership of the water infrastructure, any private sectors investment, including sponsors equity in BOT projects, will have to be repaid with profit within the term of concessions. As the cost of private capital is usually more expensive than debt, many of African countries cannot afford to pay for the return on equity for BOT projects.

This does not mean that BOT projects are not a variable option for African countries for establishing water infrastructures. In fact, it can be useful when establishing the facilities that require expertise that are not available in host country, such as desalination plants and the merit of employing BOT format outweigh the high cost of capital.

[23] Prime minister of Senegal is trying to convert current affermage into concession. However, many donors are considering it to be implausible.
[24] Detail of the project is not allowed to disclose.

The issue with higher financing costs of BOT, or PPP in general has been widely argued even in UK or Australia, where PPP was pioneered and practiced for a long time. Generally shared view is that the benefit of PPP in terms of timeliness in completion, better performance level and operational risk sharing with the private sponsors / financiers can more than offset the higher financing costs compared with the same project being implemented as public works.

In Africa, the difference in finance cost between the government debt and equity from private sector is even wider. Therefore, even larger benefits have to be identified before starting to construct specific facilities using BOT formats. On top of introducing the advanced technologies, the government should design the BOT contract to better share operation and completion risk with the private sponsors, namely giving upside for better performance and downside for failures.

One testament to the possibility of BOT in African water sector is that IFC is advising the government of Rwanda on potential bulk water BOT project. While it would take more than a year before the competitive bidding process begins, we should follow the development.

iii) Required amounts

For the only BOT project which has been seriously examined by multiple donors, the total project cost is approximately 1 billion US dollars, which is to be financed 25% equity and 75% debt. The debt portion is further split into concessional and commercial loans but both of these are to be solely financed by donor agencies, either through public or private windows.

AfDB also had several large scale BOT candidates when this study was initiated, whose funding requirements range from 60 to 500 million US dollars. However, none of those projects move forward.

iv) Identification of the projects

In most countries, opportunities to provide private and market based finance are limited. At the same time, many of the project development activities are supported by technical assistance provided by donors. Therefore, the best way to search for projects would be to contact the followings; line ministries of the host government, PPAIF at Word Bank, Advisory Group at IFC, USAID, DFID, AfD and other donors active in Africa. At the same time, when pursuing private participation in water sector, such projects' compatibility with overall water strategy of three

DFIs should be carefully examined.

v) Investment / lending guidelines

As mentioned above, any lending or equity investments have to satisfy all the internal rules for three DFIs and the special issues for the local water sector. At the same time, investment analysis based on conservative cash flow projection is required to secure the repayment of the principal.

a. Revenue forecast

Construction of cash flow projection starts from the revenue forecast, which will be more complicated for local water utilities than for project finance of BOTs. Under BOT contracts, the project company enters into a water purchase or treatment contracts with the government / utilities and receives the agreed amount. On the other hands, the revenue of local water utilities is affected by various factors, such as population, tariff levels and non revenue water. Three DFIs should make use of competent local economists and water specialists to assess these issues.

b. Cost estimate

In the same way as revenue forecast, cost estimate for local water utilities is more complicated than BOTs. A BOT project for a specific facility involves a limited number of equipments and employees and they do not change during the course of contracts. On top of this, a part of operation can be outsourced to a third party at fixed costs, which makes cost estimate even simpler. For local water utilities, the cost of operations can be affected by the changing size and scope of services, the labor costs that are frequently affected by the political issues, and many other unknown factors. In this respect, too, the local expertise is required for the realistic and comprehensive forecast.

c. Debt Service Coverage Ratio (DSCR)

When three DFIs lend to water utilities or BOT projects, debt service coverage ratio, or DSCR, should be calculated based on the formula below.
(Available cash for debt service in quarter/year) / (Debt service amount)
Lenders should look for a DSCR of no lower than 1.4.

d. Internal Rate of Return (IRR)

When three DFIs invest in equity, internal rate of return (IRR) should be calculated based on the available cash for the shareholders, which is the profit after tax. IRR is the discount rate that makes the net present value of all cash flows from a particular project equal to zero. Higher the project's IRR, the more profitable the project is. Low IRR means higher probability of investment loss.

vi) Required return

Required return varies for each instrument, country, tenor and many other factors. An interview with one donor revealed that the borrowing cost to the same project / utility can be different if the funds are sourced from banks or pension funds. It is difficult to state any required return until the project is identified and duly analyzed.

vii) Measurements of development impacts

Developmental impacts of funding mechanism can be measured by the net impact of project which was made possible because of the financing. In this sense, if the financing terms are comparable to existing funding sources such as local banks, the funding mechanism does not have any additionality. The net impact of the project should include not only direct monetary benefits but also other social impacts such as improvement in health, reduction in labor for carrying water and cultural values.

viii) Risk

Risk in lending and investing in equity can be described as any possibility of events that lead to the reduction in revenue or the increase in cost.

a. Lending to water utilities

Water utilities in developed countries are usually considered very creditworthy borrowers because both revenues and costs are stable and so is the profit margin. The story is totally different in Africa because many people see water sector as unprofitable and unstable. The primary sources of risks are as follows.

(i) Policy change

The most disadvantageous policy change is the reduction in user charge. Lower utility bills are often used as a tool to gain popularity during elections. In the same manner, the cut in subsidy from the central government to local water utilities also occurs from lower tax revenues and negatively impacts the financial health of water utilities.

(ii) Management failure

Even when the properly priced user charges can be charged, failure in management may result in poor financial performance. Examples of management failures include inappropriate strategies, inefficient operation and / or investment, overstaffing and so on.

b. Lending or Investing in BOT

Lending to a BOT of a specific facility requires analysis of additional kinds of risks from lending to utilities. They include;

(i) Project completion risk

Project completion risk refers to the risk for a project not being completed with the required specifications, within the planned cost and / or within the planned construction period.

(ii) Operational risk

Because the new facility built by BOT project has no track record of operation, special attention should be paid if the sponsor can establish efficient operating ability or hire a good third party operator with a solid track record in operations and maintenance of the similar facilities. Also, possibilities for events with significantly impacts on the operation, such as natural disasters, fire or riots, should be examined.

(iii) Sponsor risk

The project sponsor plays a very important role in a Greenfield BOT project. Until the completion of the projects, the project sponsor provides all the necessary technical and financial

support to the projects. During the operation phase, the sponsor is responsible for resolving any conflict between the government, local communities, banks, employees and so on. As a financially and/or technically weak sponsor poses the risk to the project, analysis of the sponsors is very important.

ix) Risk mitigation

a. Against policy changes and management failure

Once the policy change is announced, it is very difficult to reverse it. Therefore, the best way to mitigate this risk is to closely monitor the policy formation process and to advocate certain policies if necessary. Methods of monitoring include local news coverage, minutes of national/regional congress and frequent conversation with the key personnel. Since these daily monitoring is difficult to carry out from overseas, the coordination with three DFIs' local representatives, other donors and local professionals would be important. The regular dialogue with the regulatory agencies is effective also to hold the central government accountable for the support of water utilities.

Close monitoring should also be the key to monitor the quality of the management. For this point, too, the cooperation with three DFIs' local representatives, other donors and local professionals should be employed.

b. Against specific risks to BOT projects

The specific risk to the project finance to the BOT project should be mitigated in the following way.

(i) Project completion risk

In order to mitigate the delay in project completion and cost overruns, lenders should carefully examine the contractors' reputation and track records in similar projects. Also, an agreement must be in place that prevents lender loss by having the project sponsor guarantee debt repayment or contractor retain the obligation to compensate for damages (and performance bond that guarantees this obligation) in the event the project is not completed.

(ii) Operational risk

In order to mitigate the operational risk, lenders should examine the operators' reputation and track records in similar projects and, in some cases, require operators to provide performance bonds. On top of that, an insurance agreement should be in place to protect the project against any unforeseen accidents, such as fire or riots.

(iii) Sponsor risk

Analysis of the sponsor risk should include credit risk, technical expertise and its commitment to the project and the country. The credit risk analysis is the same as what commercial banks do when they provide loans. The analysis of technical expertise involves examination of the track records in similar projects, as a company and for key personnel. The commitment to the project should be examined by the relative size of the projects to the company's operation, its fit to the company-level strategy and actual financial and human capital already committed and injected into the project.

Also, project lenders and the sponsor may agree on the potential assistance that the project sponsor is to provide if the project company encounters any trouble.

If three DFIs invest in minority share of the project company, shareholder agreement with the main sponsor should be created. The purpose of such agreement is a protection of minority shareholders' rights because they are easily denied under the majority voting. Shareholder agreement should provide for veto rights on critical issues, tag-along[25] or drag along rights[26] and potential means of exit, such as a put option[27] to the main sponsor.

3.2.3 Organizational framework for a permanent funding mechanism

The table below is an example of organizational framework for a potential permanent funding mechanism. While the actual arrangement shall be based on the purposes of the organization, requirements from investors and the regulatory issues of the countries in which the organization operates, it is provided for illustrative purpose.

[25] If the majority shareholder sells his stake, minority holders can join the deal and sell their stake at the same terms and conditions
[26] If the majority shareholder sells his stake, minority holders are forced to join the deal
[27] Minority holders right to sell their shares at pre-determined price in pre-determined date to the main sponsor

Figure 38 : Organizational framework for a potential permanent funding mechanism

	Concept	Non-bank finance company	Private equity fund
(1)	**Organization**	Corporation (easier to borrow L-T debt from banks)	Closed-end partnership (easier to dissolve)
(2)	**Fund management**	In-house	General Partner (limited partners pay management fee and incentive)
(3)	**Selection of manager**	Recruit from private sector (banking) based on the track record	Based on the track record of the key managers
(4)	**Shareholders and their roles**	Host government (provide credentials and official/unofficial supports)	
		Donors (provide credentials, recruitment and technical support)	Donors (provide credentials)
		Private investors (provide technical expertise and financial discipline)	Private investors (provide financial discipline)
(5)	**Deal sourcing**	Host governments, donors, banks, private water service providers, water utilities	
(6)	**Screening criteria**	Enabling environment, track record of managements/sponsors, economy of scale see 3.2.2. (4) b) i)	
(7)	**Deal Selection / Investment guideline**	See 3.2.2. (4) b) v)	
(8)	**Deal flow**	Identification → Screening → Due Diligence → Decision → Disburse	
(9)	**Instrument**	Long-term debt (small amount of equity can also be invested as an "equity kicker to improve return)	Private equity
(10)	**Term of each investment**	Long term loan of 15 years or more	Invested equity has to be sold within 10 years or before the end of the fund period
(11)	**Target return**	Depends on a country	Typically 15% on dollar terms

		(funding costs plus 2-4%?)	
(12)	**Term of the organization**	Perpetual	Usually closed-end (13-15 years)
(13)	**Funding source**	Equity (host government, donors, private)	
		Mezzanine debt (Donors)	
		Senior debt (Commercial banks / bond investors)	
(14)	**Fund raising**	Equity & mezzanine debt ; negotiation between host governments, donors and private sector entities)	Equity; negotiation between fund managers and potential investors (host government, donors and private investors)
		Senior debt (Syndicated loans / infrastructure bonds with tax incentives)	
(15)	**Developmental impact**	Net value addition of projects made possible by the funding mechanism (see 3.2.2. (4) b) vii))	
(16)	**Recovery of principle**	Repayment	Dividend, IPO, Trade Sale
(17)	**Risk and risk management**	See 3.2.2. (4) b) viii), ix)	
(18)	**Other support**	See 3.2.2 (4) a), 3.3.2.(4) a)	

We had presented a non-bank finance type mechanism for lending and private equity type as well as fund type for equity investment. At this point, there is a bigger need for debt but the future demand for equity investments will increase if three DFIs succeed in promotion of PPP in the water sector in Africa.

(1) Organization

Since the very long term debt is needed for water infrastructure, non-bank specializing in water sector should be incorporated as a corporation, which is an open ended entity and suited for borrowing from banks or debt issuance. On the other hand, private equity investors prefer a closed-end partnership because they want their investments back after the fund term.

(2) Fund management

Due to the stable and long term nature of debt return, it is recommended to have in-house fund management unit. Such in-house mechanism helps accumulate know-how over the water sector lending and establish a long-term relationship with creditors, such as donors and commercial banks. On the other hand, the private equity funds are usually managed by the general partner of the fund, who has a special expertise and wide-connection to make private equity investments possible. General partners also require an incentive fee which is usually 20% of excess return over predetermined level.

(3) Selection of manager

Either a manager is in-house or a firm, the selection of it is based on the past track record of the same or similar field of investments.

(4) Shareholders and their roles

Because water infrastructure in Africa is a difficult area for private funds to invest in, host governments and donors should be involved in the formation of a non-bank or a private equity fund as anchor shareholders. Involvement of the host government and major donors send a signal to the market that they are supporting efforts made by a non-bank or a private equity fund. In a case of non-bank, having a major commercial banks or other financial institution can provide technical expertise through advice given at shareholder meetings.

(5) Deal sourcing

Both for debt and equity, deal should be sourced from regular contacts with host governments, donors, banks, private water service providers, water utilities.

(6) Screening criteria

Screening should be done three ways. First, the deal has to be in a country with a decent enabling environment. Second, the borrower / investee has to be managed by the qualified managers with sufficient independence from political influence and other outside sources. Third, the deal has a sufficient economy of scale. For further discussion, please refer to 3.2.2 (4) b) v).

(7) Deal selection and investment/lending guideline

Please refer to 3.2.2 (4) b) v).

(8) Deal flow

Identified projects from deal sources are to be discussed by the investment managers and possibly referred to the investors for comments. Once the team decide to put resources for detailed analysis (due diligence), team of professionals, such as lawyers and accountants are retained. Then, the managers and sometimes the investors make final decisions based on the result of due diligence.

(9) Instrument

As mentioned above, a non-bank has to provide a long term loan to finance water infrastructure because of its long payback period, preferably in a local currency. Private equity investment should take the highest risk of construction phase and is to be sold once the operation and cash in-flow stabilizes.

(10) Term of lending

Lending term should exceed 15 years. Private equity will have to be sold before the end of the fund period.

(11) Target return

It is very difficult to generalize the required return as they are influenced by risk level, inflation level, alternative investment opportunities and investors' appetite for risk at the time of investment.

(12) Term of organization

Corporation is an ongoing entity and usually no deadline is set. Private equity funds are usually closed hand at around 8-16 years. Because of long-payback period of water infrastructure, fund term should be set at longer end of the horizon.

(13) Funding source

Non-bank finance company has to leverage up its equity by borrowing from banks or issuance of bonds, in order to increase its funding capability and improve return on equity. If the equity level is small to attract enough debt, mezzanine debt from donor agencies or private investors with higher risk appetite should be considered.
On the other hand, private equity funds do not borrow at fund level but at the investee company level.

(14) Fund raising

Initial equity is usually raised through direct negotiations between an anchor investor / a general partner and other investors. As for the debt, a non-bank has to establish a track records and strong portfolio of loans before asking commercial banks to lend to it. Bond issuance requires even longer and stronger track records.

(15) Measurement of developmental impacts

Please refer to 3.2.2 (4) b) vii).

(16) Recovery of principle

For debt, principle is repaid based on the agreed schedule. For equity, investors have to get back the principle from receipt of dividend or sale to the market (IPO) or a third party.

(17) Risk and risk management

Please refer to 3.2.2 (4) b) viii) and ix).

(18) Other support

Three DFIs should provide technical assistance and/or program loans to support the creation of enabling environment and capacity building as described in 3.2.2.(4) a) and 3.3.2.(4) a).

3.3 Funding for water PPP in semi-urban water sector

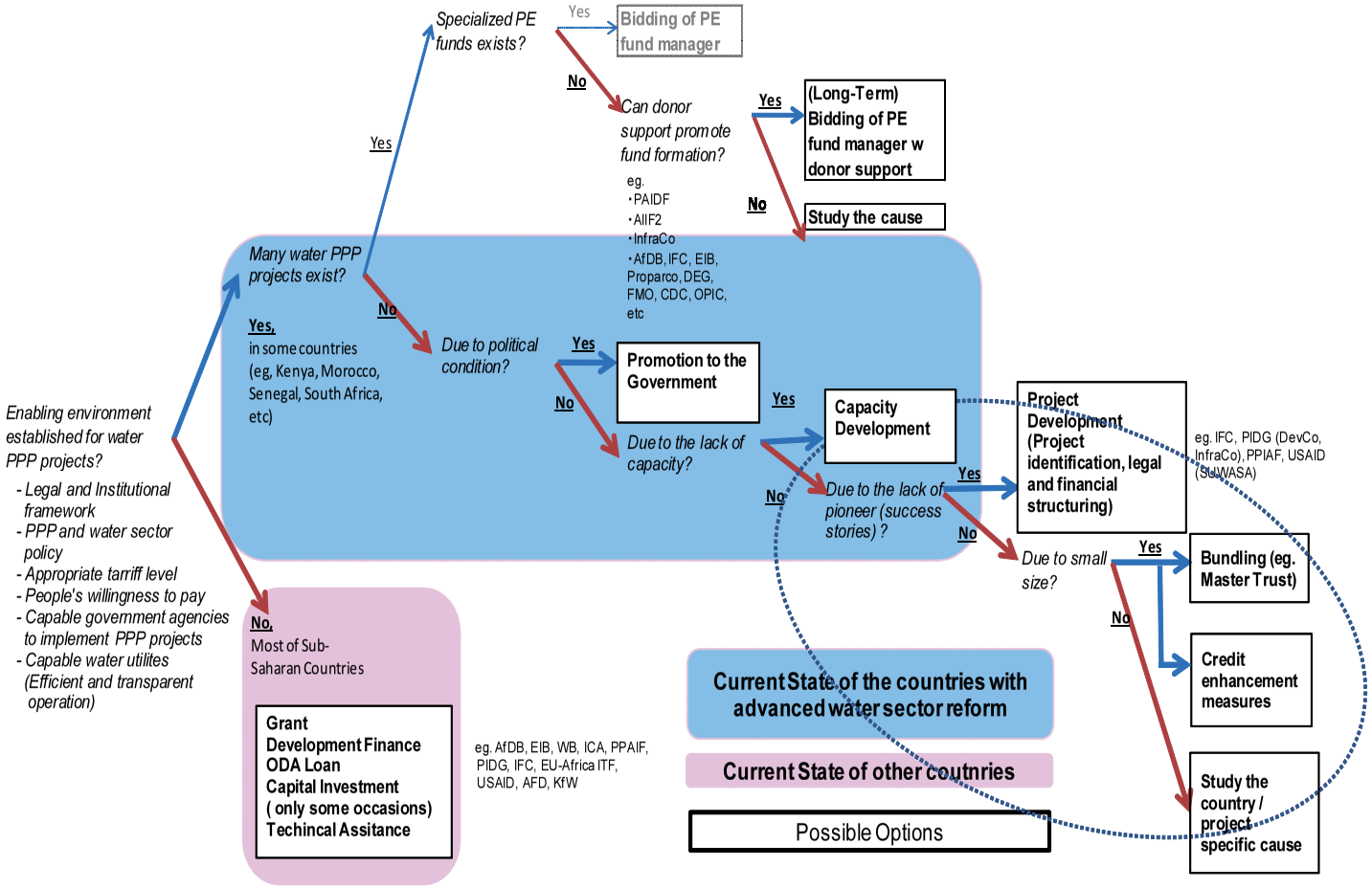
It is unlikely for small water utilities in Africa to have concession contracts or BOT projects because they lack economies of scale to justify the transaction costs. For any transaction, the same level of fixed costs is required for such items as legal or accounting fee. If the transaction requires $500,000 of fixed cost, it means 1% for a transaction of $50 million but prohibitively high 10% for a transaction of $5 million. As the preparation for concession contract and tendering is very costly process, the only viable option to introduce private funding should be sub-sovereign lending.

In wealthy country like Morocco, public water utilities for second-tier cities have access to long-term loans from domestic banks. However, in most countries in sub-Saharan Africa, small water utilities are struggling to secure finance. While a large urban water utilities and rural areas receive certain attention from donors and given soft loans and grants, respectively, the financial flows to small water utilities are limited. For discussion on this missing middle, please see 2.3.4.

3.3.1 Donors initiative

The requirements for realization of bankable projects are basically the same between urban PPP projects with larger transaction size, and semi-urban PPP projects with smaller transaction size. However, semi-urban PPP projects need to resolve the issue of high transaction costs for the same unit of borrowing.

Figure 39 : Possible options and existing donor initiatives for PPP in semi-urban water sector



Due to this additional constraint, small utilities' dependence on public funding is even higher than larger utilities. Majority of donors are concentrating their efforts on providing grant aids and not much efforts are made for private participation or sub-sovereign lending.

Some donors have been exploring various initiatives for attracting local private financial resources to the water sectors in Africa, but have not achieved success because of the high costs of borrowing. In order to lower the financing costs to the borrower, several techniques of innovating financing have been considered, including bundling of several transactions, blending of private funds with concessional loans and grants, pooled finance, combination of microfinance and output-based aid, as well as introduction of standard documentations.

In order to realize the pioneering deal for introduction of market based funds in small water utilities in Africa, three DFIs should provide human and monetary resources to the potential projects, including Kenyan Pension Financing transaction below.

3.3.2 Suggested actions for three DFIs (USAID, AfDB and JICA)

(1) Short-term

a) Some analytical viewpoints of financing water project in small and medium sized cities

The Study Team visited Nairobi, the capital city of Kenya with JICA, to collect information of a local water project that tries to mobilize pension fund investments and is now under discussion with USAID for further development of financial scheme. After exchanging views with the potential stakeholders, the Study Team found several important points to construct a financial scheme for small water supply projects in peri-urban and local areas. Of which, followings are some points which are not peculiar to Kenya but seem to be common in developing countries that should be checked and cleared if a project needs to be financed by private sectors.

i) Stability of institutional framework

In developing countries, legal and institutional frameworks of water system are often exposed to risks such as political shakeup and administrative reform that hinders the investment decision especially by the international investors. For example, in Kenya, local government system is expected to be restructured after constitutional amendment in 2012. It may cause difficulties in

designing financing structure of municipal water supply business, as legal status of the business entity may be changed during loan preparation period.

ii) Domestic long-term financial market

Because of the currency risk, it is difficult to mobilize the fund from international market, especially in the developing countries. Therefore, it is necessary to expect mobilizing necessary money for capital investment in water supply sectors from domestic resources. Fostering long-term domestic financial market as well as encouraging fund providers such as institutional investors for long-term projects would be essential in developing countries.

iii) Disclosure and reliability of financial information

Even if institutional investors have interest in water supply business, they would not make loan or investment without reliable financial information disclosed properly. Many of the municipal water businesses have not yet prepared the proper / audited report financial statements. Setting up the proper disclosure system and improving reliability and accuracy of the information in financial statements should be required to involving the private sector.

iv) Structuring of financial scheme for small sized projects

Projects size in peri-urban and local area is small, which accordingly means financial transaction cost of those project is relatively high. It also leads to difficulty in mobilizing private money to municipal water supply business. To cope with this situation, some financial devices such as bundling of several water projects by using SPV (Special Purpose Vehicle) may be of use to make the size of the project sufficiently sizable to attract potential investors.

v) Utilization of OBA mechanism

It is also important to utilize the mechanism, such as output-based-approach (OBA), that pays for the services based on the quality of the services actually provided, to ensure materializing the investment by utilities as planned.

iv) Monitoring and safeguard

After financial close, the lenders have to monitor the performance of borrowers and their

projects to secure their loan paid back safely. However, it is not so easy to watch the projects carefully especially for the project consisted of a number of small sized projects spreading over a wide area. Delegation of monitoring task to a reliable bank with local network may solve this problem.

It is also important to set up security package including control of borrower's cash flow and financial assets as well as providing insurance. Also, appointment of agencies that represents lenders and works as a servicer to collect receivables could also help to facilitate the investments in developing countries.

b) Search for potential transaction and support for structuring bankable transaction

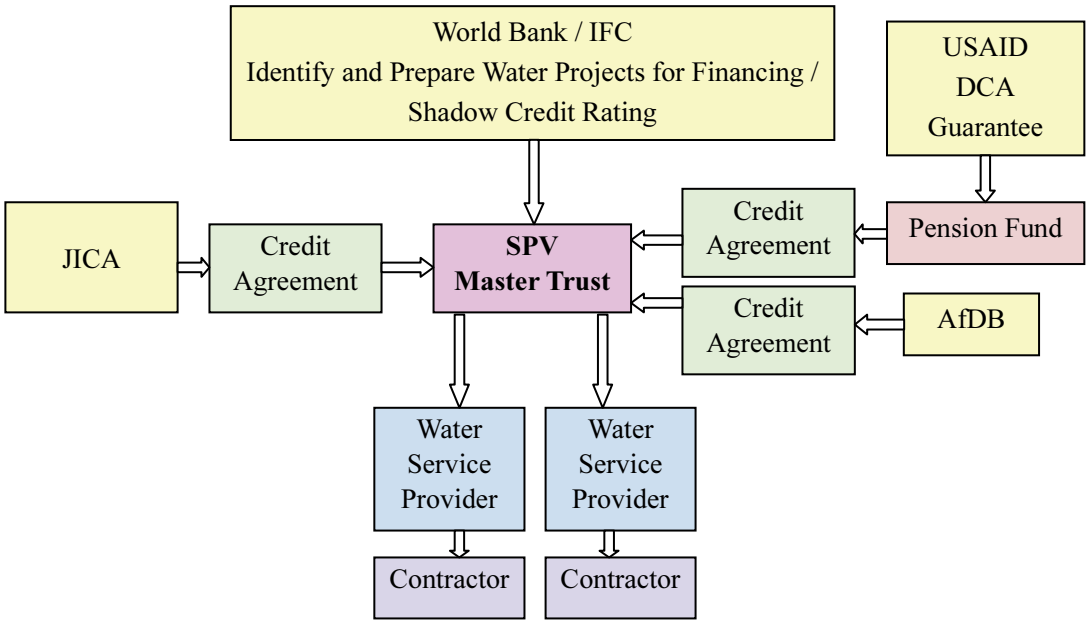
At the same time, three DFIs should look for a potential project which can utilize market based private financing. Deal selection and risk mitigation considerations are basically the same as those described in the 3.2.2 (4) b).

In the short-term, three DFIs are recommended to make reference of the various models when designing financial structure in the African context.

i) Bundling of several projects through the use of master trust: Kenyan Pension Financing

One way to solve the problem of high transaction costs is to bundle several transaction of similar kind in a master trust and borrow from banks or issue bonds at one time. This concept has currently been examined by USAID for the project to channel pension funds to the local water utilities in Kenya.

Figure 40 : Structure of Pension Fund finance in Kenya

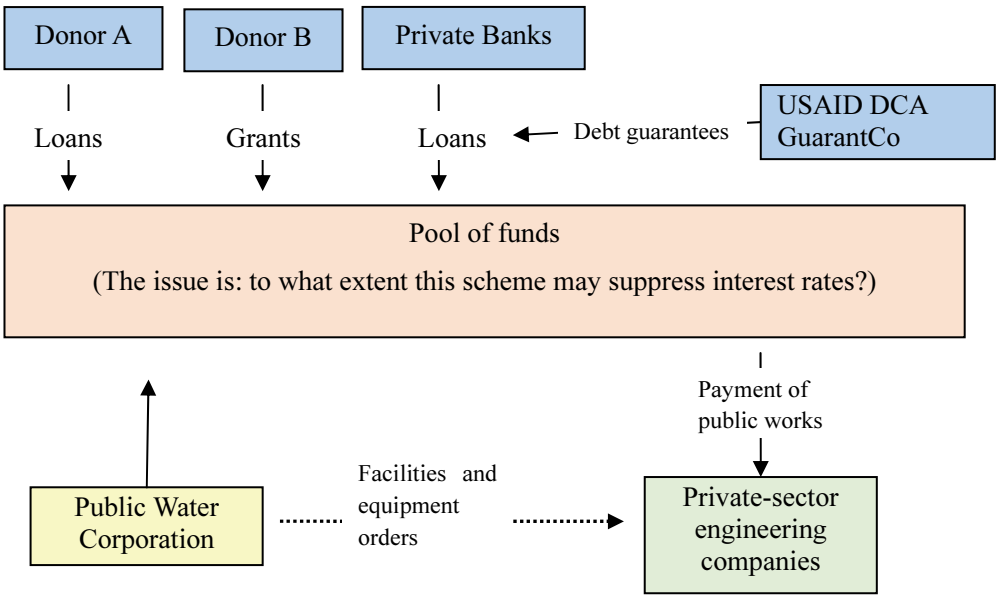


ii) Blending of private funds with concessional loans and grants

According to PIDG, it has so far assisted several public water corporations in issuing their bonds, but has not seen much progress to date, due largely to high costs of borrowing. To lower the costs, PIDG is currently exploring a funding scheme in which a public water corporation receives a mixture of grants, concessionary low interest loans and commercial loans with partial guarantees from GuarantCo and USAID.

The following chart shows the outline of PIDG funding scheme (compiled by JERI based on PIDG interview).

Figure 41 : Image of low cost finance by blending donor and private funds



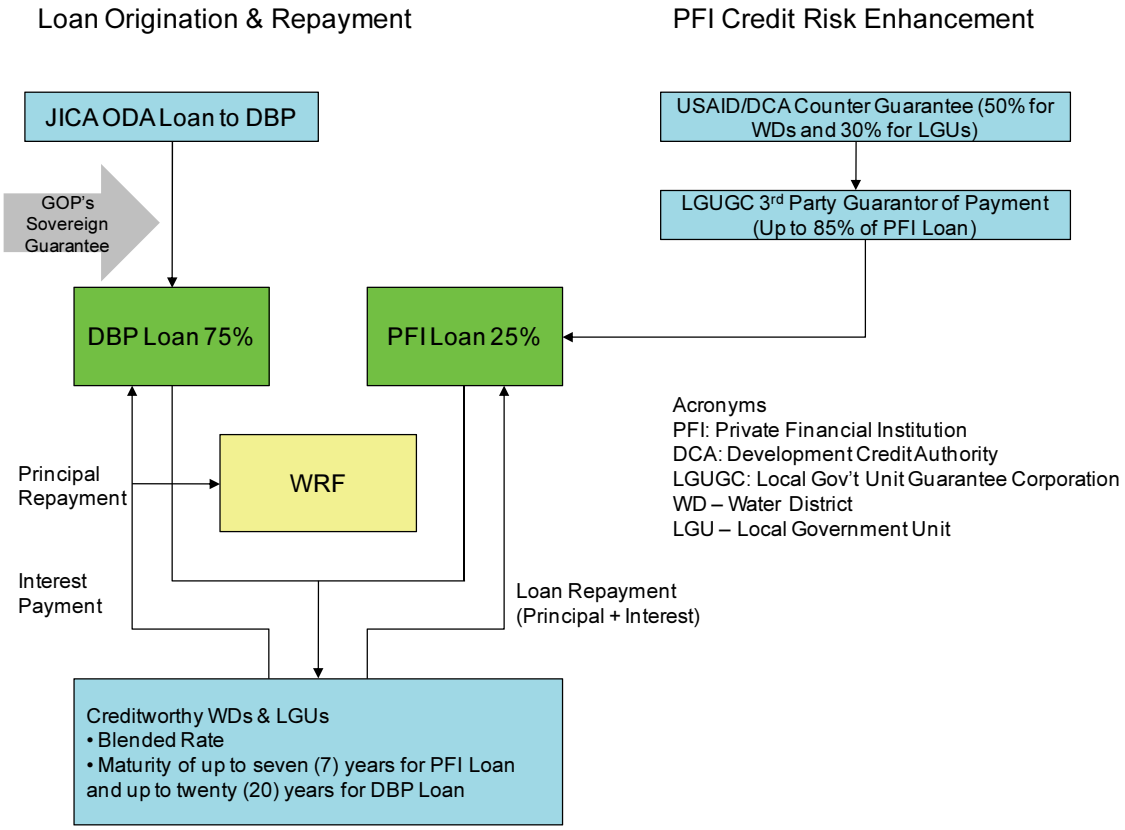
iii) Pooled finance and revolving facility

Currently, there are several attempts made by the donors in collaboration with private entities and/or NGOs to set up the innovative finance scheme to improve the access of the private funds for the water sector development in developing countries.

The Philippine Water Fund can be a good example for Africa. The Philippine Water Fund was initiated in joint effort by USAID and JICA, by leveraging JICA loan and USAID guarantee to catalyze private sector participation and ease transition from public to private financing. In this facility, JICA provides long-term concessional finance to the Government of Philippines to the Development Bank of Philippines, to on-lend to the creditworthy local government units (LGUs) or water districts (WDs) for 50% to 75% of required loan. The private financial institutions (PFIs) will supplement the rest of the funding requirements (25% to 50%), In order to facilitate PFIs to lend to LGUs and WDs, the PWRF will also provide a credit or default risk guarantee (up to 85% of the total loan amount) through LGU guarantee Corporation (LGUGC), which is counter guaranteed by Development Credit Authority (DCA) of USAID, up to 50% for WD loans and 30% for LGU loans.

Through this scheme, the LGUs and WDs are able to receive long-tenor and concessional funding from JICA via DBP.

Figure 42 : The scheme of the Philippines water revolving fund[28]



iv) Combination of output-based aid (OBA) with micro-finance

It is very difficult for donors to directly reach small scale projects in local areas directly due to the high transaction and travel costs. Local financial institutions can be a ideal partner for the donors because they have local network and capacity to extend credit for those small projects. The problem, however, is that those water projects do not have sufficient collateral to receive loans.

The Global Partnership on Output-Based Aid (GPOBA), a partnership of donors and international organizations[29], teamed up with the local microfinance institution, K-Rep Bank and USAID to resolve this issue. In order to cover the lack of collateral, GPOBA promised the lender, K-Rep Bank, to make the payment of the grant at the completion of the project, effectively using OBA as a partial collateral. At the same time, USAID provided DCA guarantee for K-Rep Bank up to 50% of the credit loss.

[28] Source: "Mobilizing Private Funds to the Water Sector", Mr. Osamu Murata, Chief Representative, Manila Representative Office, Japan Bank for International Cooperation, Forth World Water Forum, March 19, 2006
[29] AusAID, DGIS, Sida, DFID, IFC and World Bank

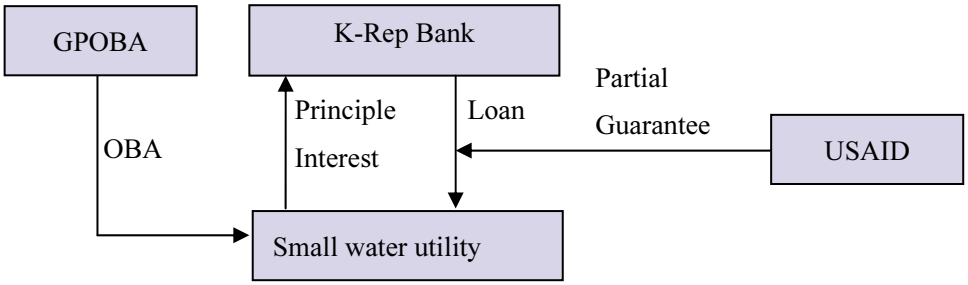
The pilot project was designed as follows;

(i) The small water utility (the borrower) contracts a loan with the micro-finance institution (K-Rep Bank) and is responsible for making debt service. USAID provides DCA guarantee up to 50% of the credit loss.

(ii) Upon successful completion of the project, GPOBA pays subsidies to the small piped water project, which reduces the K-Rep Bank's loan amounts from 80% of the total investment to 40%.

(iii) The remaining loan balance is to be repaid from water revenues.

Figure 43 : Structure of OBA-Microfinance Pilot Project



v) NGO-initiated project formulation: WSUP

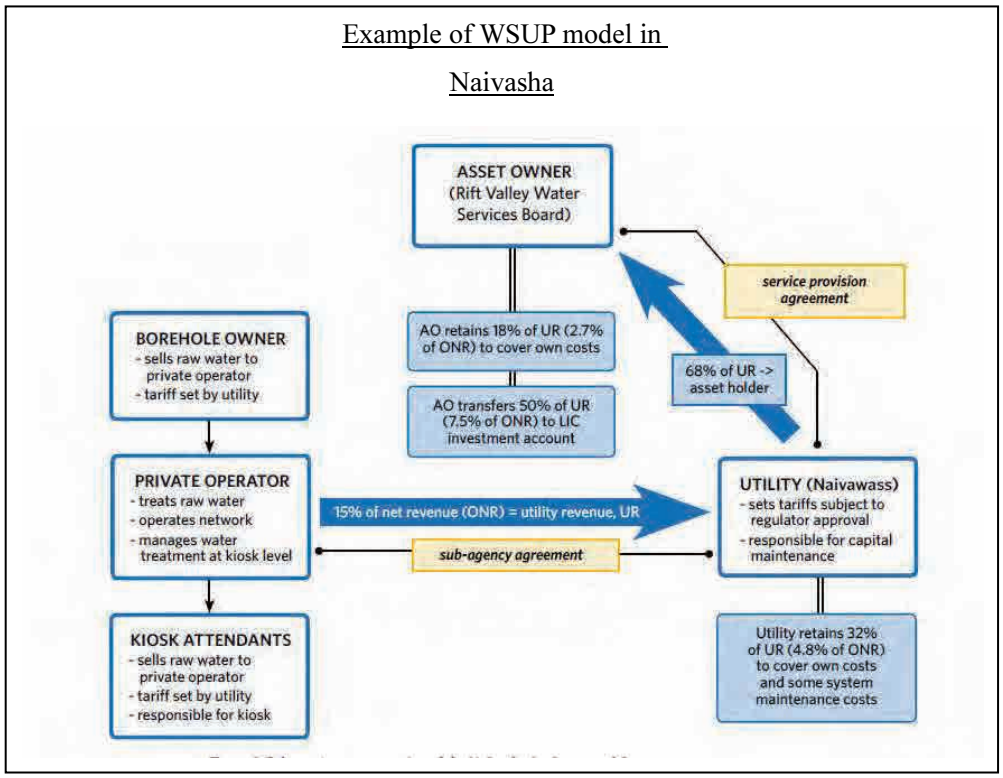
WSUP (Water & Sanitation for the Urban Poor), UK-based NGO, gives us some useful examples and suggestions for our short term scenario. WSUP is a tri-sector partnership, established in 2004, between the private sector, civil society and academia focusing on inadequate access to water and sanitation in developing countries. It supports local service providers interested in improving services to the urban poor at scale on a not-for-profit basis.

WSUP brings together skills and expertise from three sectors. From the private sector this includes technical expertise in areas such as contract design, non-revenue water (NRW) reduction, financial modeling, business planning and marketing. Civil society members provide expertise in community mobilization and participation, training, establishing community management structures and environmental protection. Academic partner provides program design and plays a pivotal role in monitoring and evaluation.

The organization is now implementing its program in 7 cities including Antananarivo (Madagascar), Bamako (Mali), Bangalore (India), Dhaka (Bangladesh) and Kumasi (Ghana). With a broad and growing knowledge base about urban water and sanitation solutions that work,

WSUP aims at not only directly supporting people of the areas but also sharing its learning as widely as possible with people who live and work in low-income settlements. Furthermore, it has been trying to develop and exhibit financial viability of their model and to encourage private sector involvement in these fields.

Figure 44 : An example of WSUP model



(2) Medium term

Once several opportunities are identified and analyzed, three DFIs should provide financial support, mostly through long-term and low-interest loans. In these processes, the possibility of creating of country and/or regional funding mechanism, such as a private equity fund and revolving fund etc. should be explored (NOTE: These funding mechanism can be realized in short-term if the feasibility confirmed).

(3) Long term

If certain form of support is proven to be very effective and considered applicable to a large pool of potential beneficiaries, a permanent funding mechanism, probably a specialized finance company, should be considered. Issues to be considered for such permanent funding mechanism are examined in 3.2.3.

(4) Other actions

In addition, three DFIs should take following actions.

a) Technical assistance

As described in detail in 3.2.2 (4) a), there exist for technical assistance needs for i) water sector reform, policy, strategy and regulation preparation, ii) awareness raising programs for communities, iii) TA for social connection programs, iv) capacity development of related governmental organizations, v) TA for capacity enhancement of public water utilities, vi) TA for credit enhancement and vii) TA for project development.

On top of them, water PPPs in semi-urban water sector with small transaction sizes in peri-urban or rural areas require the followings;

i) TA for capacity development of related governmental organizations to realize PPP projects

TA for capacity development of related governmental organizations will be almost same as large transactions. Advisory services related legal and financial aspects will be a key part of the TA.
Furthermore, under the current situation that semi-urban water utilities cannot independently manage their business and heavily depend on grant and government money, donors should support the government develop water sector strategic plan to improve environment such as unstable framework of the sector, insufficient capacity of the stakeholders and lack of financial markets and to encourage private sector participation with their know-how and financial resources.

ii) TA for capacity development of small public water utilities

The local water utilities in small and medium cities are less capable than urban utilities in most developing countries and have a worse hand to introduce private finances. Therefore, the capacity development of these utilities is essential and the TA will be more concentrated on the trainings for the basic technical and management capacity improvement as mentioned in urban utilities, including planning and managerial skill, operation and maintenance ability, reduction of NRW/UFW, billing and collection efficiency, water quality control, Information Management System, human resource management, and collection and analysis of performance indicators. Dispatch of skilled public water utility staff and acceptance of trainee from the small utilities by

donors also help develop capacity of small public water utilities. The Technical Assistance Projects Scheme of JICA and the case of Technical Assistance by Vitens-Evides in Mozambique will be useful reference.

iii) TA for preparation and implementation of social connection programs

Social connection programs will also helpful for small transactions. Compared with large urban cities, the income level of the residents is lower and subsidy to connection charge and utilization of GPOBA will be useful to increase connections.

iv) TA for credit enhancement

Most of small or medium water utilities in African countries depend on subsidies from governments and/or grant aids and have no thoughts on financing from markets because of their least creditworthiness and no knowledge on market finance. In order to increase bankable small transactions in the future, donors should provide water utilities appropriate technical assistance such as enhancement of their managerial and business skills and encouragement of fiscal transparency and accountability as explained i) and ii) above. Also it may be useful for donors to offer financial and legal advice when water utilities try to finance from markets, to structure schemes that mitigate their credit risk. As a transitional measure and within the limits of debt capacity of central government, use of partial guarantee by the government may be considered to enhance creditworthiness of the small sized water utilities for encouragement of private sector participation

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v) TA for legal and financial structuring

Small size projects in peri-urban and local area mean that they usually depend on grant and/or ODA loan and that they do not have enough knowledge and expertise of market-based borrowing. It is also the fact that their financial transaction cost is relatively high because of lack of financial scale merit. These accordingly lead to difficulty in mobilizing private money to municipal water supply business. To cope with this situation, some financial devices such as bundling of several water projects by using SPV (Special Purpose Vehicle), combination of output-based aid (OBA) with micro-finance and Philippine water revolving fund model may be useful tools for encouragement of private sector participation. Donors should help small municipal water business have legal and financial advisory for structuring the scheme described above and others.

Figure 45 : Proposed TAs for PPP in semi-urban water sector

Term	Goal of financial scenario	Possible TAs
Short-term	To build strong capacity of public water sectors and to start the model projects for them	➢ Water sector reform, policy, strategy and regulation preparation including promotion of cost recovery ➢ Awareness raising program for communities to facilitate understanding toward the significance of private sector involvement and the perception of paying tariff ➢ Preparation and implementation of social connection including examination of utilization of output-based aid mechanism ➢ Capacity development of related governmental organizations to realize PPP projects including PPP projects identification, preparation of PPP framework including financial structuring and legal advices, and tendering assistance ➢ Development of technical and management capacity of the target public water utilities ➢ Credit enhancement for the target public water utilities ➢ Project development for legal and financial structuring
Medium-term	To demonstrate successful model of public water sector	
Long-term	To scale up private money finance to public businesses	➢ Strength of technical and management capacity of the target public water utilities ➢ Credit enhancement for water utilities

In addition to these proposed TAs, it is suggested to utilize the grant facilities provided by the African Water Facility (AWF) managed by AfDB[30], as well as the USAID/PPIAF facility[31].

b) Introduction of standardizes documentation and procedures

A large part of fixed transaction costs are spent on legal documentation and negotiation on procedures. If the government can create standard templates for borrowing for water sector, it would reduce the transaction costs and time needed for closing of the deal.

[30] For the details, please refer to the footnote 21.
[31] For the details, please refer to the footnote 22.

4. Moving Forward

Private sector participation will be sure to play an important role to further develop water sector in Africa. However, the current environment there has not always been ripe for introduction of PPP in the way generally adopted in developed countries. Hurdles lie in political situation, institutional and legal framework, consolidation of financial markets, management of infrastructure services and others.

Some countries including Gabon, Morocco, Mozambique and South Africa have already experienced PPP water projects in the style of concession, affermage / lease and operation & management. At present, the Study Team concludes that PPP could become established as a tool for effective and efficient development of water infrastructure if appropriate actions are taken by the host country, donors and DFIs such as i) establishing stable framework of both water sector and PPP, (ii) fostering water business entities, (iii) consolidating domestic financial market, (iv) setting up disclosure system and improving reliability of financial information, (v) supporting structuring of financial scheme. The government of Morocco is preparing a BOT concession for the construction of a desalination plant based on the existing PPP project experience while Mozambique decided to keep management of water supply system in some urban areas in the public entities after the completion of the management contract with the private company.

As some stakeholders pointed out, it is still needed to make steady efforts to promote private sector participation. In order to reach our goal to introduce private sector resource in water sectors in Africa, three DFIs should take strategic actions in the long term framework. Below is the Study Team's proposal for three DFIs to have for their final targets in collaboration with other players.

1) Encouragement of water sector reform

In order to build up the sustainable water supply system, it is necessary to consolidate legal and institutional framework of water sector, develop water business entities that can independently build business plan, mobilize required capital investment, and control daily managements and financial operations. These are basic conditions for establishment of sound water business and promotion of private participation, however, it is not easy to attain these conditions in many developing countries. Hence, it is important to encourage the water sector reform to foster these conditions.

2) Continuous capacity building

Even if legal and institutional framework were well developed, there are cases where staff of water business does not equip with enough knowledge and know-how to maintain stable water supply business. This is especially happening in small cities and rural areas. Continuous capacity development for the staff engaged in water businesses in the field of planning, business operations and financial management are inevitable. Suggestive examples of TA for water utilities include enhancement of planning and managerial skill, strength of operation and maintenance ability, reduction of NRW/UFW, upskilling of billing and collection efficiency, improvement of water quality control, upgrading of Information Management System, proficiency of human resource management, and collection and analysis of performance indicators. TAs for related governmental organizations are implementation of PPP framework, timely disbursement of public investment, tendering assistance, establishment of dispute-resolution mechanism, and consolidation of regulatory tools.

3) Support for financial structuring for private sector participation

Small-sized business entities located in semi-urban area often have difficulties in mobilizing finance from private sector because of insufficient information disclosure, relatively high transaction cost and lack of professional knowledge to close the deal. Those small business entities have to bear extra advisory cost for structuring the finance in order to mobilize private money.

These legal and/or financial costs should be borne by the business entities as an origination cost for private participation to facilitate the project formulation to develop sound water business in Africa. Only donors including JICA, USAID and AfDB, can take pivotal role in project formulation phase by supporting the project structuring. Steady and tenacious efforts by donors to formulate the sound projects will lead to private participation and prevalence of beneficiary of water system for all.

Taking these proposed actions, three DFIs should make progresses and achievements step by step in short-, medium-, long-term, identifying financing opportunities and exploring wider range of options of creating funding mechanism such as a private equity fund and the Philippines typed revolving fund etc. As for USAID-AfDB and JICA-PSIF collaboration, three DFIs should specify the target countries and project to be implemented together at the first stage,

then, subsequently design the basic framework and examine its financial and legal structure, and conduct the feasibility study step by step.

Appendix 1 : Multi-donor initiatives on Grant, TA and soft loans to African water sector

The donors, especially the European donors who have been working closely with African countries, are well aware of these impediments surrounding the water PPP in African Countries. In order to cope with these issues step by step, and to make the African countries to receive the required funding to meet the development needs of the water projects, donors and DFIs have been taking comprehensive approach, not only by directly financing the projects, but also by providing capacity building and technical assistance, to ultimately attain the Millennium Development Goals (MDGs) for Water and Sanitation; the proportion of people without sustainable access to safe drinking water and sanitation to halve, by 2015.

In African countries, the donors have been collaborating through number of initiatives as below, in addition to PIDG and PPAIF. The European donors have been actively participating in these initiatives, to ensure the coherence, consistency and complementary of each donor's activities, to meet their developmental goal with those of EC and EU policies.

- **Infrastructure Consortium for Africa**

  The Infrastructure Consortium for Africa (ICA) was launched at the G8 Gleneagles Summit in 2005, with the members include the G8 countries, the World Bank Group, the African Development Bank Group, European Commission, European Investment Bank and the Development Bank of Southern Africa.

  ICA does not provide any finance for the infrastructure projects, but acts as a platform to catalyze donor and private sector financing of infrastructure projects and programs in Africa by advocating for increased investments by both public and private financiers to key infrastructure areas including water sector by removing technical and policy barriers.

- **The African Financing Partnership**

  The African Financing Partnership (AFP) is a collaborative, co-financing platform amongst Development Finance Institutions (DFIs) active in private sector project financing in Africa, with the aim to help reduce poverty in Africa by mobilizing resources for private sector development in Africa, by enhancing the effectiveness and efficiency of financing in Africa for the main sectors[32] including water and sanitation.

[32] Three main sectors of operations under the AFP are 1) Infrastructure – Power, Transport, ICT and Water/Sanitation, 2) Industries – Extractive Industries, Agribusiness and Healthcare, and 3) Financial Institutions – African DFIs, Banks, Microfinance, Guarantees.

The eight DFIs, including AfDB, DEG, DBSA, EIB, IDC[33], IFC and FMO, called the AFP Promoting Partners, signed the AFP MOU in 2008. The AFP will commence its operation from 2011, and is expected to co-finance to the eligible projects with large funding requirements, but the details, which will be outlined in the operational guidelines that is going to be completed in 2011.

- **The EU-Africa Infrastructure Trust Fund**

The EU-Africa Infrastructure Trust Fund (EU-Africa ITF) is an instrument of the wider EU-Africa Infrastructure Partnership. The EU-Africa ITF became operational in June 2007, with the aim to increase EU investments in regional infrastructure in Africa, working together with other initiatives, actors and instruments, and on the basis of African ownership.

The EU-Africa ITF provides grants for TA and interest subsidy for the loans from European Investment Bank (EIB), EU development financiers and the African Development Bank (AfDB). So far, the EU-Africa ITF provides grants for Lake Victoria Watsan – Kampala Water Projects for Uganda in 2010[34]. The details of the supports are as follows;

- TA grant for 8 million EUR, for the planning, options study, project preparation and hydraulic analysis, to develop an integrated master planning and improve knowledge related to impacts from waste water, climate changes and other variables.
- Interest Rate Subsidy grant for 14 million EUR, to blend AFD's own resources loan of 64 million EUR in order to achieve terms compatible with the debt strategy of the Government of Uganda.

- **European Financing Partners (EFP) Initiative**

The EFP initiative was created in 2003 with the aim of promoting sustainable development of the private sector in ACP states and strengthening co-operation between 12 European Development Finance Institutions[35] and the EIB. EFP is a Luxembourg-based investment company, and acts as a catalyst for mobilizing investment in private sector operations, ultimately benefiting entrepreneurs in emerging markets who seek long-term financing to support their business growth. It has also contributed to strengthening co-operation

[33] Industrial Development Corporation of South Africa Ltd.

[34] The objective of the project is to create viable utilities with improved ability to implement and operate the necessary infrastructure for water supply, sanitation and waste management of the Lake's water, while developing viable approaches for incorporating services for poor populations. The total project cost is estimated at 212 million EUR and will be financed through subsidized loans and grants from AFD, KfW, EIB and the EU-Africa ITF, as well as equity from the National Water and Sewerage Corporation (NWSC).

[35] BIO (Belgium), CDC (UK), COFIDES (Spain), DEG (Germany), FINNFUND (Finland), FMO (Netherlands), IFU (Denmark), NORFUND (Norway), OeEB(Austria), PROPARCO (France), Sifem (Switzerland) and SWEDFUND (Sweden)

between, and increasing the visibility of eligible European development cooperation. EFP provides loans, equity, quasi-equity, and guarantees from 1 million EUR to 25 million EUR, to support the development of the private sector enterprises in ACP region. It does not exclude for the investments in water projects, however, no investment has been made to the water sector yet.

Appendix 2 : Funding mechanisms for PPP projects: private equity and debt funds

The size of African private-sector infrastructure investment is smaller than those of Asia and Central and Southern America. Unlike telecommunications (cellular phones, broad band fixed lines) and power generation, there are a limited number of toll roads projects, and much less number of water supply projects.

There exist many private funds, which aim to invest in "African infrastructure". Of which, investments are made mostly in natural resources, telecommunications and electricity.
Many private funds emphasize investment in water as their funding priority, despite their lack of experience (to meet the needs of donor-investors as well as with due consideration of the potential size of the African water market.)
Investors of these funds, besides those from Africa, are either international institutions or donor agencies. Prior to the global financial crisis, there were European and Japanese commercial banks exploring lending opportunities in infrastructure projects. At present, however, the sole provider of loans and investments is donors (i.e. their private-sector debt and equity finance divisions of AFD, CDC, DEG, EIB, FMO, IFC, InfraCo of PIDG and PROPARCO, as well as debt funds such as EAIF.)

Followings are the details of the funds.

- **Pan-African Infrastructure Development Fund (PAIDF)**

  PAIDF is designed as a large-scale long-term fund, to assist Africa's critical shortage of equity investment in basic infrastructure, and seeks to invest across the African contents. The fund is managed by Harith Fund Managers, whose shareholders are Public Investment Corporation (a manager of Government Employees Pension Fund in South Africa:46%), Old Mutual Life Assurance Company (the biggest financial group in South Africa:12%) and ABSA capital (a subsidiary of Barclay's Bank and one of the biggest finance service provider in South Africa: 12%), and the management of Harith Fund Managers (30%).

  PADIF commenced its operation in 2007, and currently manages US$670 million from investors from South Africa (South Africa's Public Investment Corporation on behalf of the Government Employees Pension Fund, ABSA Bank, Metropolitan, Old Mutual and Sanlam) and Ghana's Social Security and National Insurance Fund, as well as from developing

financial institutions (African Development Bank (AfDB) and Development Bank of Southern Africa (DBSA)).

With a long-term investment horizon of 15 years, the PAIDF provides long-term equity financing, and other forms of investment, such as quasi equity, structured finance and high yielding debt, which will allow the fund to make above average returns on capital, are also considered. The fund will invest in regional infrastructure developments across the African continent with particular focus on energy, information and telecommunication, transport and water and sanitation.

According to Harith Management, the sectors which comprise of PAIDF's current portfolio are mainly resources, power, ICT (optical fiber), and transportation. Even though they have examined the investment possibilities for water projects, they haven't made any investment in water sector, and it is less likely that the PAIDF will invest in a water project in near future, due to its highly politicized characters.

- **African Infrastructure Investment Fund II (AIIF 2)**

AIIF2 is formed in March 2010 by African Infrastructure Investment Managers (AIIM) which was established as a 50-50 joint venture between the Macquarie Group, a leading private infrastructure investor, and the Old Mutual, a South African financial institution. AIIM was established in 2000 to manage AIIF, a successor fund to South Africa Infrastructure Fund (SAIF) formed by the Standard Bank of South Africa.

During the previous funds, investments are made mainly to the South African Development Community (SADC), largely because investors are mostly from South Africa. AIIF2, on the other hand, is aimed at investing on the African continent as a whole and intends to induce investments from other countries outside Africa. As one of the prominent project, the AIIF2 is preparing for investing in BOT projects for bulk water facility in Ghana.

Under the AIIF2, new investment targets, besides SADC, are being pursued with the assistance from the parent company Macquarie Group and IFC which has maintained a good working relationship since the inception of AIIF2. Major non-African investors are Macquarie Group, IFC and European aid agencies such as FMO, Proparco and AfD, and $5 million commitment from the Berkshire County (U.K.), while African investors include Old Mutual, AfDB, DBSA and Transnet Pension Fund. (Transnet is a large South African rail,

port and pipeline operating company, with a majority of the company's stock being owned by the government.) New investors are to be invited until September 2011.

- **Emerging Africa Infrastructure Fund (EAIF)**

EAIF, the debt fund under PIDG, has been specifically established by PIDG members and AfDB in 2002 for the purpose of providing market based finance to private infrastructure projects in Africa.

EAIF, which is managed since December 2001 by Frontier Markets Fund Managers (FMFM) (a subsidiary of Standard Bank of South Africa), has provided long-term loans (both in dollar and euro) to private infrastructure development in Africa. The current capital amounts to $600 million, including $150 from PIDG, $95 million from DEG / FMO / DBSA/ IFC and $355 million from KfW / Barclays / Standard Bank / IFC /ADB. As well, there is a Stand-by Senior Loan Facility (of about $25 million) provided from IFC / AfDB.

After being operated for 10 years, EAIF's investment portfolio has been steadily built up these years.
Regarding EAIF's loan portfolio, 34% is in power generation, 29% in telecommunications, 11% related to mining and 11% in transportation. There has been no investment made in the water sector (with no plans for future as well).
There is still a great need for financing infrastructures, and EAIF plans to raise additional funds towards the next year.

Appendix 3 : Summary table of existing schemes by donors and development finance institutions

Currently, there are number of financial and other schemes available for supporting the promotion of the infrastructure PPP projects in African countries, provided by the donors and DFIs, as well as the multi donor Initiatives. The table below is the summary of the schemes to sovereign and non-sovereign entities available for the water projects in Africa by the donors and DFIs.

Summary of the Existing Schemes by Donors and DFIs

Type of Institution	**Target Sector**		**Products**							
	Public *	**Private ****	**Investments in**		**Loans**			**Guarantee**	**Grant**	**TA**
			Equity	**Funds (Equity & Debt)**	**Commercial-based Loan**	**Concessional Loan**	**Dev. Credit**			
AFD	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	
AfDB	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
CDC		**X**	**X**	**X**		**X**		**X**		**X**
DEG		**X**	**X**	**X**	**X**			**X**		**X**
EAIF		**X**			**X**				**X**	
EIB	**X**	**X**	**X**	**X**	**X**			**X**	**X**	**X**
FMO		**X**	**X**	**X**	**X**			**X**		
IFC		**X**	**X**	**X**	**X**			**X**		**X**
IFC-SFD	**X**		**X**		**X**			**X**		

Type of Institution	Target Sector		Products							
	Public *	Private **	Investments in		Loans			Guarantee	Grant	TA
			Equity	Funds (Equity & Debt)	Commercial-based Loan	Concessional Loan	Dev. Credit			
KfW	X	X			X	X	X		X	X
MIGA		X						X		
NEPAD	X								X	
OPIC		X			X			X		
PIDG		X	X	X	X			X		X
PPIAF	X								X	X
Proparco		X	X	X	X			X		
USAID		X						X	X	X
WB - IBRD, IDA	X	X				X	X	X	X	

*Public: Including governments, local authorities, publicly-owned entities and PPPs that are not privately managed. These sectors obtain finances with sovereign guarantee.

**Private: Including private companies and public-private partnerships (PPP) that are privately managed. These sectors obtain finances without sovereign guarantee.