

Sharing the Reform Process

Learning from the
Phnom Penh Water
Supply Authority



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Learning from the Phnom Penh Water Supply Authority (PPWSA)

Binayak Das, Ek Sonn Chan, Chea Visoth, Ganesh Pangare, and Robin Simpson



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Abbreviations

ADB	Asian Development Bank
AFD	Agence Française de Développement
AGD	Assistant General Director
BIWASE	Binh Duong Water Supply Sewerage & Environment Company Limited
CC	Coordinating Committee
DG	Director General
DMAE	Departamento Municipal de Água e Esgotos
FMC	Funds Management Committee
HR	Human Resources
IDA	International Development Association
IFI	International Financial Institutions
IUCN	International Union for Conservation of Nature
JICA	Japan International Co-operation Agency
NRW	Non-Revenue Water
NRWC	Non-Revenue Water Committee
NWSC	National Water and Sewerage Corporation
O&M	Operation and Maintenance
PPWSA	Phnom Penh Water Supply Authority
SCADA	Supervisory Control and Data Acquisition
SWOT	Strength Weakness Opportunity Threat
UNDP	United Nations Development Programme
USD	United States Dollar
WB	World Bank

Preface

With a large percentage of the world's population moving to urban areas, clean, affordable and timely supply of drinking and domestic water to its residents has become a priority.

In most cities of the world, the primary responsibility of supplying drinking and domestic water lies with public utilities. It is a well known fact that water utilities around the world suffer from a series of ailments like poor cost recovery, poor and intermittent supply, and deficit budgets.

In recent times significant efforts have been made to reform water utilities through supporting policy changes, public-private partnerships and multi-stakeholder dialogue processes. However some of the most successful models have demonstrated that it is the public utilities themselves that have been able to bring about the much-needed change such as Porto Alegro in Brazil, Kampala in Uganda and Phnom Penh in Cambodia.

This publication shares the reform process undertaken in Phnom Penh that has catapulted a war-torn dilapidated water utility into an efficient and profit making utility.

This positive transformation has been possible due to enabling policies and political support, granting autonomy to the water utility, appointing a visionary leader and motivated workforce, bringing in efficiency within the system and involving various stakeholders in the process.

The PPWSA has shown that it is possible for reforms to become successful if the governance framework is supportive and public utilities can make profits or at least break-even, with affordable tariffs and timely supply of water.



1 | Water Utilities in Asia: Status and Successes

1.1 Inefficiency galore

Wise use and good management of water resources is an important requisite to ensure environmental sustainability. This factor is often not correlated to management of urban water supply systems especially in the developing world of Asia, Africa and Latin America, where poor management leads to inefficient water usage, water loss and degradation of water quality, which in turn affects the environment. Many developing countries have continued to be beleaguered by inefficient water utilities that have been performing poorly for a long time. Ever-increasing urban populations have generally overwhelmed the limited management capacities and resources of water utilities at all levels. Unplanned and poorly managed urbanization processes have been an important source of social and environmental stress in all developing countries.

Urban water problems in developing world cities such as those in South East Asia are viewed as the consequences of rapid and uncontrolled urbanization and unsustainable development. The pursuit of economic advancement had conjured a disregard for environmental conservation, which in turn has resulted in water problems of considerable magnitude. Many of the Asian cities' publicly managed water utilities perform below their potential. Urban water management in Asian cities is plagued by a myriad set of problems.



The rapid urbanization of Asian cities demands better management of its water utilities.

It is estimated that 40% of the population of Asian cities with a population of more than a million, mainly the poor, do not have access to piped water ([See Table 1: Piped Water Coverage – Asian Cities](#)). Less than 60% of the population has access to piped water in Delhi, Dhaka, Jakarta and Manila. Many consumers, due to lack of coverage, have to go to informal sector vendors for their water needs, often at a considerable expense and the quality of the water is suspect. For instance, in Manila, people pay 5 USD per cubic metre (m^3) for buying water from a vendor, while piped water costs 0.10 USD/ m^3 – a differential of 50. Only 30% of Asian cities have 24-hour water supply. The rapid onset of urbanization has made urban water management a priority area in order to avoid large scale collapses.

Table 1 : Piped water coverage – Asian Cities (based on connections)

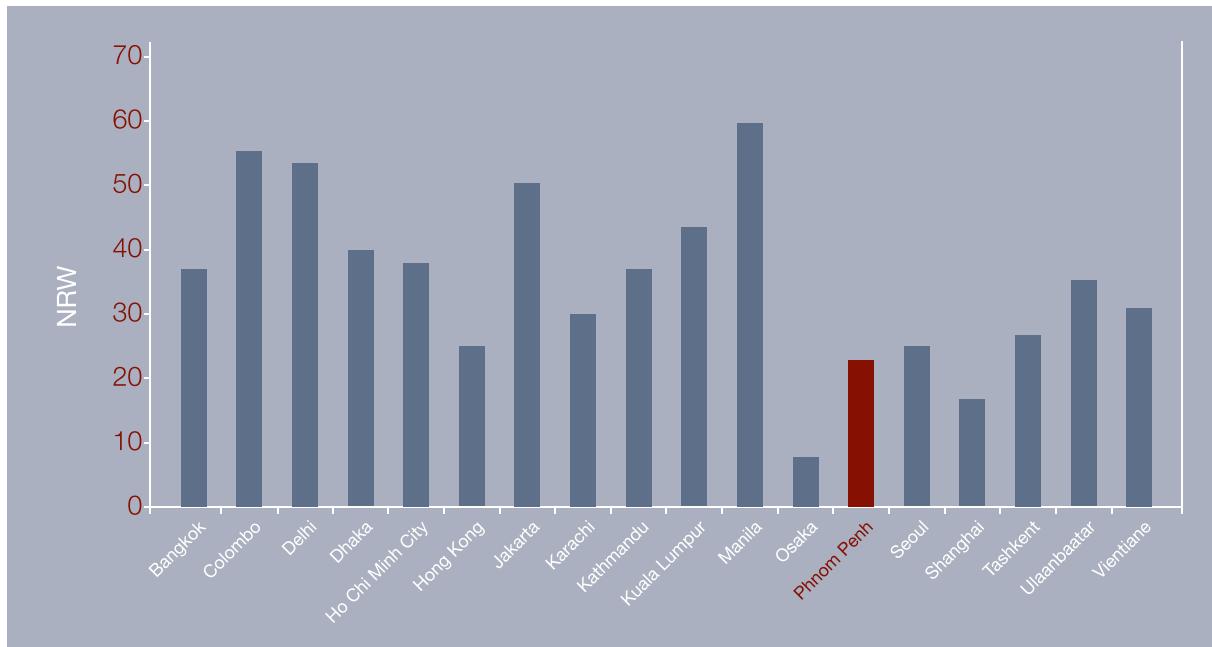
City	Domestic Connections		Increase (%)	Coverage (%)
	(1996)	(2001)		
Bangkok	951,543	1,090,786	15	72
Delhi	1,096,916	1,266,303	15	46
Dhaka	160,000	176,823	11	10
Ho Chi Minh City	236,433	337,500	43	32
Jakarta	312,168	564,527	81	31
Karachi	830,366	1,280,000	54	47
Kathmandu	92,600	119,891	29	54
Manila	719,878	794,827	10	32
Phnom Penh	27,387	62,970	130	31
Shanghai	1,753,190	2,909,053	66	100
Vientiane	22,273	36,121	62	45

Source: McIntosh A 2003, Asian Water Supplies-Reaching Urban Poor, Asian Development Bank and International Water Association

Some of the major causes for the inefficient services with enormous losses in terms of water and revenue are due to a multitude of vicious cyclic factors, which include poor management and political interference. The utilities are mostly bankrupt and are dependent on government doles to function. The political class in many Asian cities uses water as a vote bank tool and is not willing to undertake tariff reforms. Corruption is also high, as the political class want to protect their power base and access to funds. The lack of reforms leaves the utilities short of adequate revenue to invest in creating assets and in operations and maintenance (O&M) of the utilities. These results in having a utility that fails to deliver effective quality service. Quality of construction is poor, and O&M works take a long period time for completion. Water supply is intermittent as the distribution network is extended beyond hydraulic potential due to political one-upmanship. Illegal connections are high in number as they fetch bribes to employees, and this in turn leads to low water

pressure. High non-revenue water (NRW) and low accountability arose from these illegal connections along with lack of appropriate metering, inadequate billing and leakages in networks due to poor maintenance (See Chart 1: Non-revenue in Asian cities -2001).

Chart 1 : Non-revenue water in Asian cities-2001



Source: McIntosh A 2003, Asian Water Supplies-Reaching Urban Poor, Asian Development Bank and International Water Association

Another key factor that is responsible for this undesirable situation of water utilities is inefficient management and lack of skilled personnel. Historically, Asian water utilities have been managed by civil servants. Civil servants' rules, however, are bureaucratic, outdated, and suppress transparency. Civil servants are promoted according to rank and seniority and may lack the adequate skills for management. Engineers dominate water utilities and specialists for finances and management are missing. Most of the water utilities are overstaffed and under-skilled. Nepotism and interference from politicians and powerful people leads to recruiting of unskilled people as a water utility is a source of job creation. Also, the lack of awareness among consumers allows the utility operators to run it according to their whims and fancies with no accountability. Lack of autonomy is hampering reforms within water utilities.

1.2 A few successes

Given the poor status of public water utilities, critics have argued that private sector participation can lead to better management; but due to a variety of factors and controversies, private participation did not take off or bring any major changes. In the meantime, some of the public water utilities in the developing world initiated reforms with support from the government and donors agencies. Over a period of time, some of



In the city of Porto Alegre, Brazil, communities participate in the management of the city's water utility.



The water utility of Uganda has built a strong response team to handle grievances.

the public water utilities' reform processes met with success proving that sincere and committed reforms within the water utilities with political, governmental and donor support can bring major improvements. Allowing autonomy to the water utilities with adequate financial support and good leadership can improve the performance of these utilities and also make them financially sustainable. Some of the examples of better management include the water utilities of the Brazilian city, Porto Alegre; the capital of Uganda, Kampala; the Bolivian city of Cochabamba that went through major water riots¹; and the Cambodian capital of Phnom Penh, which also recovered from an intense period of genocide and civil war.

In Porto Alegre, Departamento Municipal de Água e Esgotos (DMAE) is a publicly owned water utility which focuses on social inclusion and has been able to achieve tremendous amount of success in involving local communities in the city's water management. Tariffs play an important role, and DMAE set the sanitary infrastructure with the utility's own revenue.

Similarly, the National Water and Sewerage Corporation (NWSC) of Kampala has achieved a high degree of success since it undertook reforms. NWSC had a strong infrastructure, water resources and a legal framework but was lacking an efficient labour force, had high NRW and poor service, among other drawbacks. After reform, the service coverage increased from 48% to 70%, NRW was reduced by 20%, and the utility went from loss to profit in a span of eight years, generating 34 million USD.

¹ Cochabamba water utility was handed over to a private firm that led to riots in the city and ultimately the private firm terminated its contract to manage the water utility

1.3 Phnom Penh's success story

In the same league is Cambodia's Phnom Penh Water Supply Authority (PPWSA), which suffered from the problems familiar to many other Asian water utilities. This publication focuses on the Phnom Penh reforms, which are exemplary in nature. After the country's virtual destruction during the mid 1970s by the Khmer Rouge regime, attempts at recovery during the 1980s were hampered by international trade sanctions until 1993. PPWSA faced an extreme situation, and this makes the story of recovery even more remarkable. The service was plagued with the same maladies of inefficient service, high NRW, poor coverage and financial losses. PPWSA undertook major reforms and transformed a war-ravaged water utility into a commendable model.



PPWSA caters to all citizens' water needs in Phnom Penh.

Over a period of 15 years, PPWSA went through major changes that catapulted the water utility into one of the more successful water service providers. The results and achievement have been exemplary, and it has not stopped with that; PPWSA is continuously evolving, expanding and introducing newer processes.

There have been overall reforms within PPWSA, with new processes being introduced in various departments that helped to bring about the changes. The water authority was granted autonomous status with independent management. Political support for the reform process came with the Prime Minister giving full support, and available funds – in the form of grants and loans from various multi-lateral agencies – created the enabling environment. Peace and stability within the country also helped PPWSA. A skilled set of enthusiastic employees and a leader with vision and a focused commitment helped to change the functioning of PPWSA, leading to improved service provision for all consumers across the social spectrum (See Box 1: Ek Sonn Chan, leading from the front).



The source of water for PPWSA is from the Mekong river.

Box 1 : Ek Sonn Chan, leading from the front

The change of guard in the Phnom Penh Water Supply Authority (PPWSA) was an important factor that triggered the reform process. In 1993, Ek Sonn Chan took over as the General Director of PPWSA. With over 30 years of experience in the trade, electricity, water supply and sanitation sectors, Ek Sonn Chan's appointment as the PPWSA head began the utility's transformation from a decrepit and war-torn water supply system with missing water and customers into a model public sector water utility that provides 24-hour, safe drinking water to Phnom Penh. As the result of his hard work and excellent management, PPWSA was rapidly rehabilitated and developed until it reached full autonomy in December 1996. Since then, PPWSA is growing everyday and operating with full cost recovery. The task has not been easy, and Ek Sonn Chan has had to deal with life-threatening situations. When he tried to make everyone pay for their water consumption, one army officer refused and even pointed a pistol at him, but that did not deter him and ultimately the concerned defense official was forced to pay. Similarly, when internal reform was initiated within PPWSA, there was resistance to change and employees tried to involve powerful figures and the media, but again he did not budge.



Ek Sonn Chan is popular among his employees and gets support from them, as well as from consumers. He has been awarded national and international awards among which are six Golden Medals from the Government of Cambodia, 2004 Water Prize from the Asian Development Bank with the for his excellent and outstanding leadership in the contribution to realize the MDG "Water for All," and the 2006 Roman Magsaysay Award for Government Service for the same feat.



2 | Phnom Penh: The Transformation

Phnom Penh, the capital of the Kingdom of Cambodia ([See Map 1: Phnom Penh](#)), lies on the confluence of the Mekong and the Tonle and Bassac rivers. These rivers are the source of freshwater for the city's population of around 1.3 million.

2.1 PPWSA area of operations

There are eight districts in Phnom Penh, and PPWSA has delineated them with zonal water meters installed for each zone ([See Map 2: PPWSA zones](#)). As some of the zones are big, renewal and redesign of the coverage is still ongoing. According to the 2020 Phnom Penh Master Plan, the city has an area of 513 square meters (sqm). There are four inner and four outer districts. PPWSA has 100% coverage in the inner districts, while in the outer districts (which also include peri-urban and rural areas) coverage is between 60 to 70%. Lack of roads and organizational infrastructure is hampering PPWSA's efforts to increase coverage in peri-urban areas.

Map 1 : Phnom Penh



Source: www.wikipedia.org

2.2 PPWSA from 1979 to 1993

PPWSA has been catering to the city's water needs for more than 35 years. Over time PPWSA has expanded with the growth of the city, and by 1975, PPWSA was producing 150,000 m³/day, with a supply network of 282 kilometers. From 1975 to 1979, however, due to political instabilities within the country, the water supply system became largely defunct, as many of its production and distribution facilities collapsed and the Khmer Rouge eliminated many of the skilled employees².

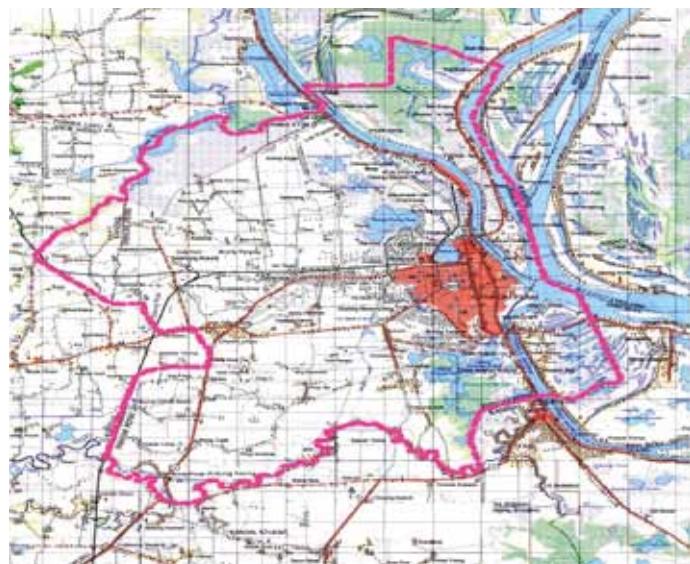
The water supply utility was made operational again in 1979 after the change in the political situation. The utility managed to produce only 65,000 m³/day, which was 45% of its initial capacity. The lack of electricity, chemicals, funds, and qualified personnel to undertake proper O&M prevented the utility from carrying out its services to full capacity. The problem was further compounded when the public took matters into its own hands and made thousands of illegal connections by building underground tanks. In 1986, the water utility company was authorized to bill consumers for water supplied within its network. It was revealed that about 26,880 customers were registered, but less than 40% actually paid their water bills. NRW exceeded 70%, and the total revenue covered only about 50% of operational expenditure. The distribution network was also very old. Staff were under-qualified, underpaid, unmotivated and lacked efficiency. Nepotism was widely practiced, and discipline among the workers was low. The billing system was also improperly documented and highly inaccurate.

2.3 PPWSA from 1993 onwards

Since 1993, however, a long series of transformations that started within PPWSA's top management, based on a culture of change and donor support, led to a significant turnaround ([See Box 2: Result of reforms](#)). The factors that contributed to this turnaround included investing in staff and providing incentives, promoting transparency, involving civil society, and investing in modern management procedures and

Map 2 : PPWSA zones

Source: PPWSA



This map of Phnom Penh shows the coverage area of PPWSA. The inner area demarcated in red is the urban core while the outer pink lines shows the peri-urban areas covered by the utility.

² The Khmer Rouge were radical Marxists who controlled Cambodia for four years from 1975–79 and are infamous for their state-sponsored massacre of millions of Cambodians.

technology. The top management was restructured, and dynamic younger personnel with more advanced qualifications were promoted to senior posts with more responsibilities. Senior management was given more direct responsibilities, while inefficient senior staff was moved into unimportant roles. Incentives such as higher salaries and bonuses for good performance were introduced³. However, penalties were also imposed for bad performance. There was resistance from staff in the beginning, especially by managers who used all means, including the media, to resist change. The dogged pursuit, however, of the DG and top management, as well as gains in public trust, changed the scenario. Staff members also felt a sense of ownership of the utility and took responsibility for all its operations.

Box 2 : Results of reforms

The reform process initiated in 1993 and carried out over the years has dramatically improved performance (See Table 2: Then and now). Residents on average consume 160 litres/capita/day of water with a 24-7 ensured supply and metered connection. PPWSA has become profitable and is continuously increasing coverage to outer Phnom Penh. Within a 15 year timeframe, PPWSA has increased its annual water production by 437% and its distribution network by 557%. Even though people are now paying for the water they actually consume, per capita daily water consumption has nearly doubled⁴.

The successful reforms and performance of PPWSA have received accolades and performance ratings from a wide range of agencies. In January 2004, PPWSA was awarded the ADB's Water Prize – an award conferred upon exemplary project agencies that have established sound practices in implementing ADB's "Water for All" policy. Ek Sonn Chan, DG of PPWSA, received the 2006 Ramon Magsaysay Award for Government Service for his "exemplary rehabilitation of a ruined public utility, bringing safe drinking water to a million people in Cambodia's capital city." The World Bank, while evaluating one of its project funding proposals to PPWSA, rated it as highly satisfactory and sustainable in the long term in most of the parameters it evaluated. It also mentioned that the project never faced risk at any time during the project implementation period. Risks which were identified at the project's initiation included the financial viability of PPWSA, the security situation within the country, and government's inability to carry out reforms. The first risk was mitigated by four factors – highly specialized TA; a twinning arrangement with a consortium of Australian utilities; annual reviews of tariffs; and a pilot programme to finance the cost of connections for the poor. The risk of the government not being able or willing to undertake policy reforms was mitigated by underpinning an agreement that policy-making would be based on a participatory approach; allowing for flexibility in policy formulation and institutional proposals, based on learning by doing; and several seminars involving all stakeholders. In consequence of the reforms, the World Bank report in 2003 concluded that, in the last decade, PPWSA has transformed itself into a well-run utility, increasing the number of connections and improved its operational and financial performance substantially. All donors have rated the PPWSA projects as highly satisfactory and successful. There have been numerous publications and articles on the PPWSA success story. An external study by Mexico City-based Third World Centre, which looks at issues critically, titled their study Water Supply of Phnom Penh: A Most Remarkable Transformation, saying a lot about the reforms in just a few words. Emphasis has been placed on the success of this public water utility, and it has been cited as a case in support of managing public water utilities without involving the private sector.

³ The salary increased by 10 times compared to before.

⁴ As mentioned in a study: Water Supply of Phnom Penh: A Most Remarkable Transformation, by A Biswas and Cecilia Tortajada in 2009.



Phnom Penh has improved its water distribution network and piped water has reached to different localities within the city.

Operations were also made more efficient by overhauling the old infrastructure, and streamlining the billing process, among a slew of new measures ([See Box 3: Making everyone pay](#)). Because of these reforms, the PPWSA has widened its distribution network from serving 40% of Phnom Penh in 1993 to over 90% in 2009 with clean, affordable water. Other improvements include establishing a complete consumer database, reducing NRW to less than 6%, improving collections, metering all of the utility's water supply coverage, and introducing 24x7 water supply ([See Table 2: Then and Now](#)).

Table 2 : Then and now

1993	Indicators	2009
22	Staff/1,000 connections	3.2
65,000	Production capacity, m ³ /day	300,000
NA	Water quality	WHO
20%	Coverage area	90%
10 hours/day	Supply duration	24 hours/day
0.2 bar	Supply pressure	2.5 bar
26,881	Number of connections	191,092
72%	NRW	5.94%
48%	Collection ratio	99.9%
150%	Operation ratio	38.41%
NA	Return on revenue	26.62%
NA	Return on net asset	4.71%
NA	Current ratio	2.55 times
NA	Debt service coverage	3.25 times
NA	Accounts receivable	24 days

Source: PPWSA records

Box 3 : Making everyone pay

Before reforms were initiated, most Phnom Penh residents, including politicians, army officers, government employees, and even PPWSA staff members did not pay for their water usage. Of the water piped from PPWSA reservoirs, 72% disappeared without ever being paid for.

When the PPWSA reforms project was inaugurated, the Prime Minister made a public statement asking everyone including government employees to pay their water bills. The new DG reiterated this directive and made bill payment mandatory for all PPWSA employees. This allowed the PPWSA to initiate a process to bill the public. There was some resistance to this, but the management of PPWSA did not panic and ultimately government officials, PPWSA staff members and other consumers started paying. By this time metering and piped networks began to function, and hence if a consumer failed to pay the bill, the water supply was disconnected after a notice was served. It was reported in 1993, that PPWSA staff members were selling illegal connections for 1,000 USD per connection. To combat corruption and nepotism within PPWSA, salaries were increased. Those who reported incidences of illegal connections received concessions in their bills.



The lessons to be learnt from PPWSA are not a panacea to be replicated, but these reforms can be a set of guiding references while undertaking reforms. This publication discusses the changes that were undertaken within PPWSA.



3 | Enabling Environment: Policies, Funds and Tariffs

3.1 Policy changes and governmental support

PPWSA is a state-owned enterprise operating under commercial law. Previously, PPWSA was under the jurisdiction of the Interior Ministry and dependent upon the Municipality of Phnom Penh and its governor. In February 1996, the Government of Cambodia issued its first Socio-economic Development Plan (1996-2000) which accorded a high priority to water and sanitation. The Plan's long-term objectives were for the water utilities to become self-sustaining commercial entities. In 1996, initial steps were taken to improve the sector's institutional framework. These comprised:

- A law providing for greater autonomy of public enterprises;
- the establishment of PPWSA as a public enterprise, mandated to operate according to commercial practices; and
- in recognition of the need to rationalize sector institutions, the creation, by the government, of a coordinating committee (CC) for the water and sanitation sector.

The CC recommended a long-term national strategy for sustainable and cost-effective urban water supply and sanitation. This plan allocated 83.2 million USD for water supply and 12.3 million USD for sanitation for Phnom Penh. This total allocation of 95.5 million USD to the city represented nearly 60% of the national funding for the water supply and sanitation sectors.

PPWSA was granted independent financial status in 1997, in line with a 1996 decree. A law was passed in 1996 entitled Law on the General Status of Public Enterprises (No. 0696/13), which provided for the very first time in the country a new legal framework for operation, management and supervision of all public enterprises. The institutions became legally independent and gained financial autonomy though they were placed under the supervision of a Government Ministry (tutelage), which consists of the Ministry of Industry, Ministry of Mines and Energy and the Ministry of Finance.

Among the important requirements of the decree were the following.

- PPWSA must organize, manage, and operate all its activities independently in accordance with commercial business requirements (Article 4)
- PPWSA could have an independent salary and incentive package for its staff, subject to approval by its Board of Directors (Article 101)

- The General Director has the authority to hire and dismiss staff (Article 14)
- The General Director must submit to the Board of Directors an annual plan each year before the 1st of October of each year, which must include (Article 20)
 - Investment and financing plans
 - Operational budget
 - Price of water and other services to ensure that total revenue can adequately cover its operational expenses
 - State financial support through subsidies to PPWSA in case of losses in its public services delivery

The General Director is appointed for a three-year period but can be reappointed to any number of additional terms thereafter. The General Director is appointed by the Prime Minister, after receiving nomination from the tutelage ministries.

PPWSA prepares an annual investment plan which has to be approved by the Board of Directors and the tutelage ministries.

3.2 Donor support

The massive turnaround within PPWSA management and services was made possible through significant donor involvement. The Japan International Co-operation Agency (JICA) has been a major donor since 1991. When urgent rehabilitation of the treatment plants was needed, the Cambodian government requested assistance from the Japanese government to rehabilitate the systems. Aid also came from France, and together, the French and the Japanese provided 5.2 million USD to rehabilitate Phnom Penh's water supply systems. JICA, in collaboration with Japanese water operators, trained PPWSA employees in O&M capacity. Engineers from Kitakyusyu and Yokohama municipality participated in this non-profit technical transfer for over three years. There was also a technical assistance project by UNDP and the World Bank to support capacity building in terms of training, skills development and the conduct of some studies. ADB supported water supply and drainage projects. In 1997, PPWSA achieved financial sustainability and started moving towards profitability. After this, donor agencies shifted from grant-making to sanctioning loans (*See Table 3: Fund flows*). PPWSA has recently repaid its WB and ADB loans and recently received one direct loan from Agence Française de Développement (AFD). The WB loan, made after service cost recovery had been reached, was paid back in four years before the period of maturity. One key reason for PPWSA's success relates to sourcing their funding from donor agencies and not being dependent on the government. Independence allowed the utility freedom to innovate and distanced it from political pressures.



Donors played a key role in supporting PPWSA.

Table 3 : Fund flows (1993-2009)

Donor	Amount (in USD)	Type of fund	Status of loans
UNDP/WB	2,803,001	Grant aid	Does not arise
JICA	84,929,815.04	Grant aid	
AFD	21,160,810.14	Grant aid	Grace period (13/12/2010 to 31/12/2018)
	14,099,882.67	Loans	
WB	28,654,894	Loans	100% repaid
ADB	12,638,749		Currently, payments made twice a year
Total	164,287,152		

Source: PPWSA 2009 status

The Japanese government, which has been involved from the beginning, provided grants to PPWSA for two master plans and feasibility studies, which included a future water development plan for the Phnom Penh water supply system. The Japanese government also agreed to carry out the study to develop both master plans. The first master plan study was prepared until 2010, and it turned out to be very important and useful, serving as a road map for the PPWSA. The Plan was developed in close consultation with the utility's management, and thus was acceptable to management, with the plan becoming the "blue print" for development for the utility for subsequent years. All the projects supported by other donors had to fit in properly with this framework, as well as comply with its overall philosophy. A new second Master Plan that covers the period 2011-2020 has also been prepared with JICA support.

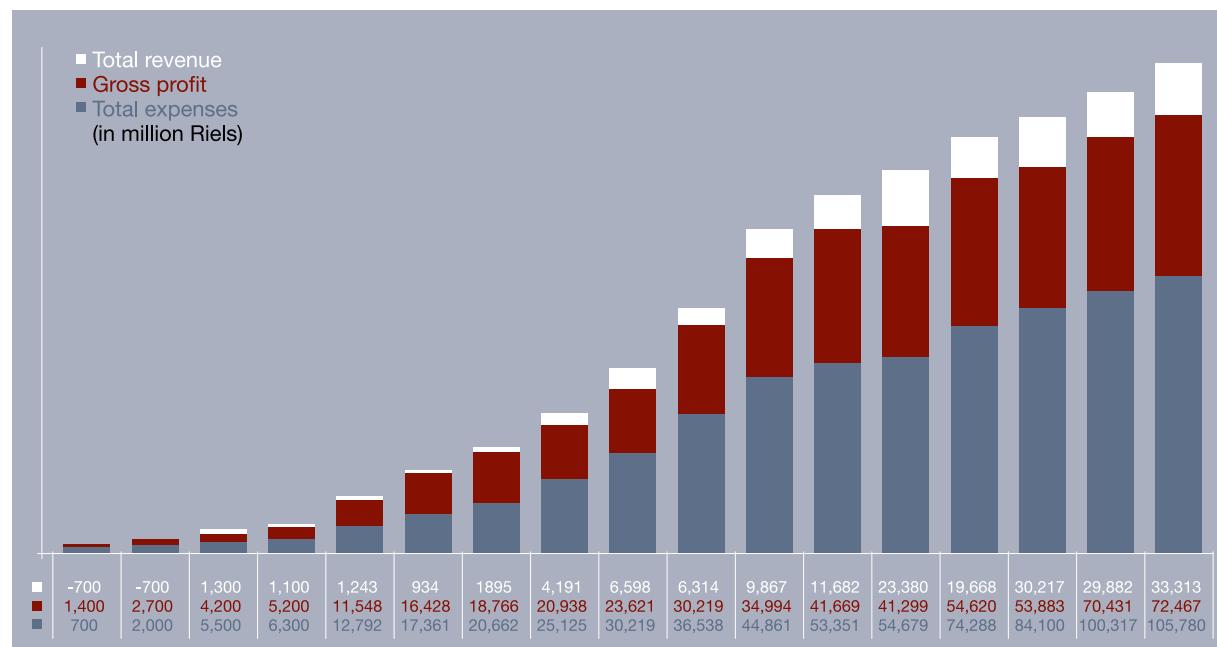
Other major donors who provided financial and technical support to PPWSA from 1997 include the ADB and the World Bank. The support however, came in the form of loans to the PPWSA instead of grants, as was the case for the initial financial support. The World Bank advised on the institutional arrangements, which resulted in the greater autonomy for PPWSA. The resultant law created a Coordinating Committee for Water & Sanitation and restructured water tariffs. In 1997, a credit for urban water supply in Phnom Penh and Sihanoukville was obtained through the Bank. The technical assistance was for a national strategy and policy framework, which consisted of a national policy on water supplies and the same for urban sanitation.

A second wave of World Bank aid for Cambodia was funding for the Provincial & Peri-Urban Water & Sanitation Project in 2003. A part of the funds went to PPWSA who utilized them for the peri-urban areas. PPWSA did receive other technical assistance from the Australian government under a twinning arrangement between PPWSA and two Australian utilities. Similarly, through the operation of the Loi Oudin in France, through which local finances in France can be used to help improve services in developing countries, a partnership was established with the city of Paris that generated funds for subsidising the poor's water needs. If PPWSA had been dependent on government funds, then the chances of losing autonomy would have been higher. Financial assurances from other sources have led to greater sustainability. Because of its significant achievements, the government also accepted this procedure.

3.3 Finances

Every year, audits on PPWSA's financial transactions are carried out by international auditors. According to the latest audited statement from PPWSA's auditors, Price Waterhouse Coopers (2009), PPWSA's operating revenue for the 2008 financial year was 21.9 million USD, out of which it made a profit of 7.3 million USD. PPWSA is one of the few publicly managed water utilities in the developing world whose net profits have increased since 1993 and have consistently paid income taxes (See Chart 2: Rising profits).

Chart 2 : Rising profits (1993-2009)



Source: PPWSA records

The main components of PPWSA's operating costs include electricity (44.97%) and chemicals for water treatment (10.73%), costs over which PPWSA has no control. Electricity costs are dictated by Electricité du Cambodge, and the chemical costs are determined by the world market prices. Salaries, wages and allowances for the staff account for another 32.16% of the annual expenditure.

3.4 Tariffs

The inherited water tariff by the utility was far too low to generate the necessary revenue. PPWSA had to increase tariff to cover operational costs. To avoid registering a big hike in the water tariff, PPWSA proposed to have a three-step increase in the water tariff over a period of seven years, along with service improvement. With strong support from the donors and commitment from the Government of Cambodia, particularly the Prime Minister and the Governor of Phnom Penh, the first step increase was achieved in 1997 and the second step in 2001. After that, PPWSA did not need to push for the third step, as its revenue

had already fully covered all its costs. This was basically due to the higher collection ratio and the drop in the NRW that preceded tariff increases.

The initial tariff plan was proposed by the ADB and adopted by PPWSA. The increase in the tariff was carefully planned. First, a socio-economic survey of the water supply situation was carried out for the city of Phnom Penh. This survey collected information on how much consumers were paying for water from other vendors, and what were likely to be their reactions if these vendors were replaced by supply from the PPWSA. This survey showed the willingness and capability of the consumers to pay a higher tariff for a vastly improved service.



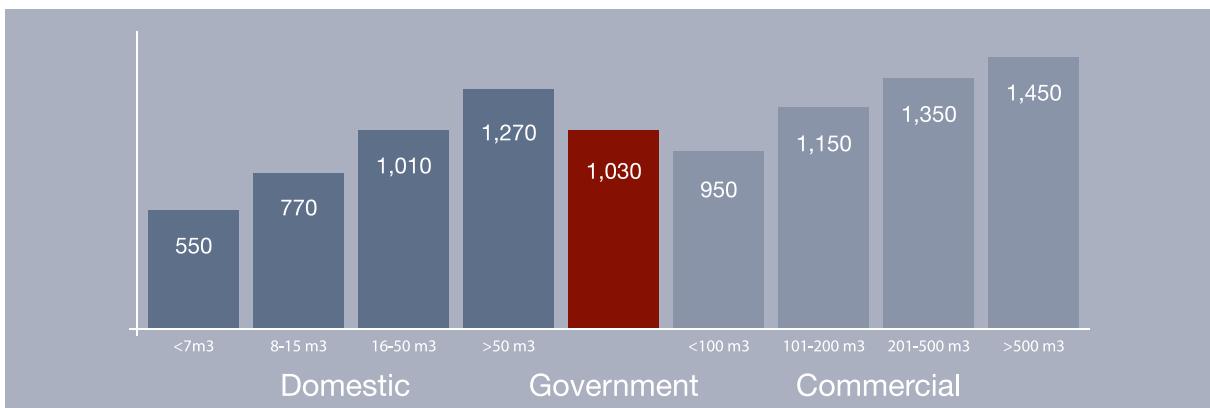
People are willing to pay for better services.

The tariff is different for domestic and commercial connections. In 1984, the first tariff was set at 0.04 USD or 166 Riel/m³. This changed in 1993, and the tariff structure was separated for domestic and commercial purposes, with the domestic tariff remaining same while the commercial tariff was fixed at 0.13 USD or 515 Riel/m³. The tariff was revised in 1996 and again in 2001. The first block tariff was established in 1997 which has been revised and is still being applied ([See Chart 3: Tariff structure](#)). The tariff for government departments is separate.

The PPWSA water tariff is progressive in nature, and revising this is a difficult process. This requires a request from PPWSA to the designated ministry of tutelage and requires the final approval of the Prime Minister.

The tariff is based on the National Water Policy and is calculated based on total expenses, i.e. O&M costs including depreciation of assets. PPWSA recovers all costs from the tariff except land costs, as they keep rising. The value of assets is revised every five years.

Chart 3 : Tariff structure (in Riels)



Source: PPWSA records



4 | PPWSA: Internal Reforms

4.1 Departments

Before 1993, PPWSA was run as a government department with no administrative, operational and financial autonomy. It was an integral part of the Municipality of Phnom Penh and was under the control of the governor of the city. It needed continuous municipal authorization for all its operational expenditures, which was a time-consuming process. Revenues earned by the PPWSA were consolidated with general municipal funds, and thus there was absolutely no incentive for PPWSA to innovate or strive to be profitable. The institution had only three technicians who could connect water meters, and the cost of connecting water meters was exceedingly high, around 150 USD per meter to 1,000 USD (the current cost is 100 USD per meter). The meter readers and bill collectors were illiterate and often kept the money they collected.

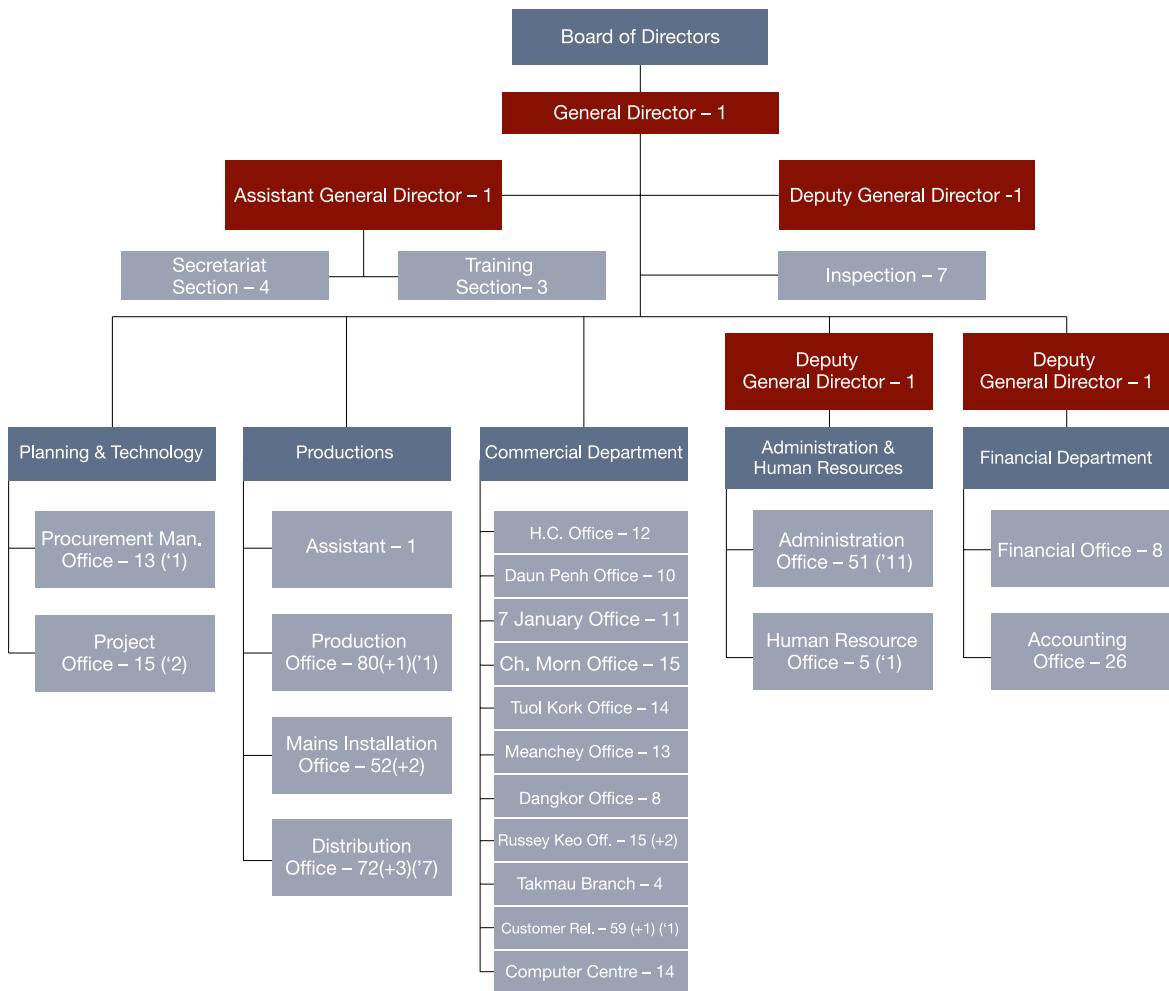
After 1993, PPWSA was overhauled, and a gradual reform process with changes in organizational structure was initiated. Now, PPWSA is broadly divided into five line departments with a separate training department and a secretariat directly reporting to the Assistant General Director (AGD). A separate inspection unit is directly handled by the DG. There is a carefully designed horizontal and vertical structure in place with the DG at the helm and with a Board of Directors above the DG ([see Chart 4: PPWSA organogram](#)). The five line departments are:

- Planning and Technical Department: responsible for all planning, procurement and projects
- Production and Distribution Department: responsible for potable water production from raw water and its distribution across the city via networks
- Commercial Department: responsible for customer billing, connections, and customer relations
- Administration, Human Resources and Securities: handles all administrative and staff-related issues like office logistics, recruitment, and evaluation
- Finance Department: handles all finance-related matters

There are a total of nearly 604 personnel within PPWSA, including the DG and staff from securities. There are 464 male employees, while the number of women employees stands at 85. PPWSA personnel can be broken up into 547 staff members, 16 trainees and 33 contract employees. There are 18 managers for the line departments. The number of staff per 1,000 connections stood at 3.5 in 2008, having come down from 22 in 1993, making PPWSA among the most efficient at a global level.

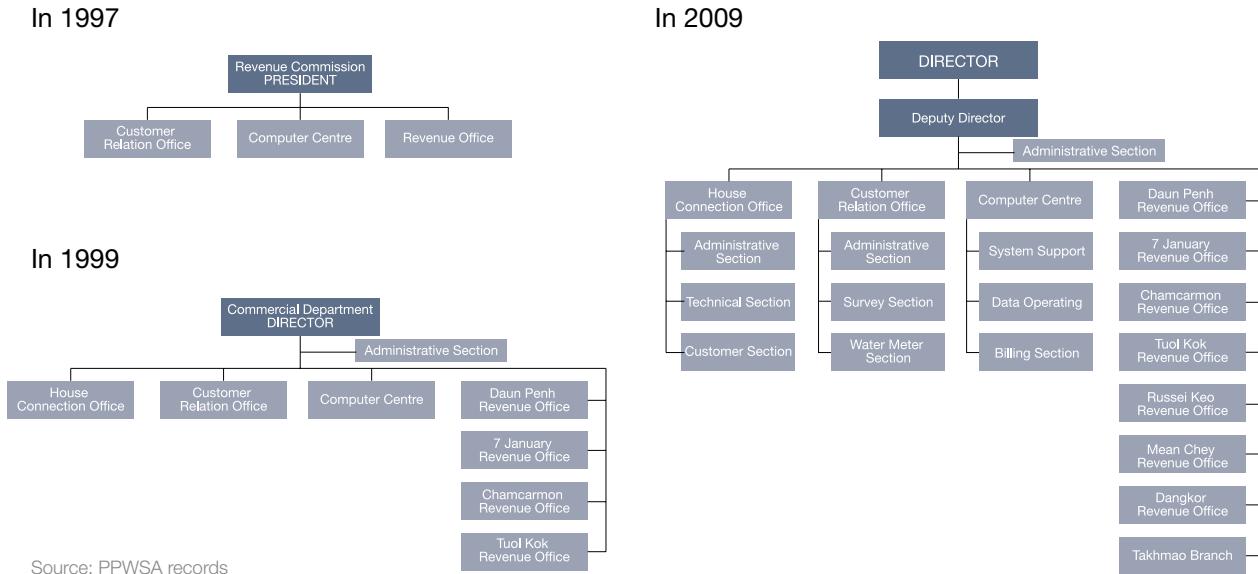
There have been major organizational restructurings, and various departments went through major changes. Some units were closed, while new units were formed and expanded. The overall PPWSA organizational evolution is a gradual process and is being implemented over time ([See Chart 5: Example from Commercial Department](#)). For example, the Commercial Department has evolved over three stages.

Chart 4 : PPWSA organogram



Source: PPWSA records (numbers indicate personnel total)

Chart 5 : Evolution of Commercial Department



Source: PPWSA records

4.2 Planning and accountability

Each department is responsible for its own planning and accountability. Overall it is a decentralized process, and every department has to produce its own annual plan. The planning department guides, formulates and monitors the plans. Short-term plans are the responsibility of the departments, from which data is collected by the planning department. Each department is responsible for implementing, monitoring and reporting. They have to deliver quarterly and annual progress reports. In all review meetings, the director of the line department has to report and also convey the problems faced within the department, suggest remedies and make recommendations. SWOT analysis is conducted for each department. There is a final evaluation based on achievements against plans.

Employees are accountable for their output. There is a set structure for evaluation that defines:

- Organizational structure
- Job structure
- Responsibilities and tasks
- Performance related to plans
- Achieved tasks
- Reasons for not achieving

Inspection is conducted by the PPWSA Board. The director of the PPWSA board is the head of the Comptroller's office, while there are also representatives from the tutelage ministries. In total there are five representatives from the government and two from PPWSA. While the DG is part of the Board, the other PPWSA representative is chosen by voting within PPWSA. The selected member can serve for a period of three years. Currently, an internal control department is currently being created. There is an established Statement of Purpose, and it is respected.



Investment in human resource has been the key to change.

4.3 Human resources

PPWSA hires staff for various job activities ranging from field workers to managers to technicians. A field-level worker has to have atleast high school education. Technical and managerial staff are recruited from universities. Often, students from universities who are hired as trainees based on performance may be offered a permanent position.

Sometimes instead of hiring external candidates, staff members are transferred from one department to another. Volunteers can be enlisted for a period of six months without any salary, but are provided an opportunity to upgrade their skills. Based on their performance, they are recommended to HR by the manager of the line department. The HR department conducts examinations for the volunteers, and successful volunteers are hired on a contract basis. A volunteer who has failed the tests gets a three months extension as a volunteer and then can again take the tests. The contract lasts six months, and PPWSA pays a salary. After a period of six months, there is another examination and on passing, the person is recruited as a trainee. After another six months, trainees write assignments on PPWSA and about their job descriptions, after which they are selected as employees. For the purpose of easy identification, a dress code exists for all employees. Field staff are differentiated from managerial staff by their uniforms.



Uniforms for all staff members help in identifying employees from different work units.

4.4 Salaries, incentives, evaluation and discipline

PPWSA invests in their staff; incentives and bonuses are considered as important elements of this investment. Wages in 1993 were meager, and this contributed to the high corruption level. In contrast, if a staff member at a managerial position was paid 20 USD in 1993, by 2008, the salary has been increased to 200 USD.

Employees receive overtime and bonuses at the end of a mission and at the end of the year. Profits are shared with employees. Incentives are offered for many aspects of performance, e.g. secondment to other water utilities in different provinces of Cambodia. A solidarity fund financed by employees allows for



Staff members have to attend trainings and appear for exams as a part of internal review process.

Apart from incentives and evaluations, disciplinary actions are also an important element of PPWSA management. There is a disciplinary committee under the HR department with the DG as head. If there is a case of lack of discipline within any department, the director of that particular department refers it to the HR department and to the DG. Disciplinary actions are dependent on employee status. An employee found to be responsible for lack of discipline, then the person is penalized. Disciplinary steps can be as follows.

- First, there is a delay in salary increment
- Second, the employee's function is changed and salary increment is delayed by one year
- Third, the second step is repeated with a 15% deduction in salary
- Fourth, there is a 35% cut in salary and the employee is shifted to a different department
- Fifth, if there is still no rectification, the staff member is dismissed

On a rare occasion does the stage of dismissal arise.

If an employee is absent from duty for three continuous days without informing the management, then the first level of penalty is imposed. Similarly, on further absence, subsequent levels of penalties are imposed.

Grievances can be communicated to their managers in writing. There is a complaint and grievance box for staff members to raise their complaints. The DG personally goes through the complaints and tries to address the issues.

the provision of interest-free loans to the poorest workers. The utility pays particular attention to staff welfare and has created a retirement system for its employees which is the first of its kind in Cambodia.

PPWSA evaluates its employees four times a year. Line managers are responsible for evaluation and are required to have face-to-face discussions with staff members. There are different sets of evaluation forms for:

- Section chiefs and assistant managers of offices;
- Office managers; and
- Staff from network operations.

4.5 Staff training

The PPWSA has a very active training department with a well-equipped training room along with training material that is regularly updated. Training sessions are organized in-house. There are attendance registers to ensure full participation during the training process. For external training, on receipt of letters of invitation, staff members from relevant departments, depending on the type of training, are selected. External training sessions are organized by donor agencies supporting PPWSA like JICA. Staff members get the opportunity to visit other water utilities, too. PPWSA staff members have attended international trainings organized by JICA, ADB, UNDP and the governments of Thailand and Australia, among others.

Within PPWSA, short training sessions are provided to staff, where external experts are invited as guest lecturers. In 2008-2009, staff members attended about 24 small and large sessions. According to the training department head, staff members go through positive changes and pick up new skill sets during these workshops. Many of the training workshops are tailored for specific departments, but there is some general training sessions related to information technology, filing, administration, etc. For HR-related training, employees are sent outside. Apart from training sessions, different departments are encouraged to share their experiences with each other.

A training committee consisting of senior employees from different departments determines the quality of the training material and approves it. They are responsible for selecting the trainers and advise on improving the overall training process.



Training is an important part of the change process.

Training does not end with workshops. All personnel attending training have to appear for exams after the training sessions. They have to pass the exams for performance appraisal. All staff members have to take an annual exam which was initiated in 2006. It is an important exam within PPWSA, and failure in these exams result in salaries being not increased during appraisal. On passing the exams, results are evaluated along with performance during the training period based on which salary is increased.

Occasionally, staff members are selected to attend a Master's programme to universities within the country and for short courses at foreign universities. The courses that are attended by staff members are often related to management, not technical issues

pertaining to water. For example, the Director of Human Resources and Administration was nominated by PPWSA to attend a Master's programme on management at the Cambodian University of Specialization.

The PPWSA also undertakes training workshops for other water utilities, and many water utilities from across the region have participated. PPWSA employees have been invited as guest lecturers in workshops organized by JICA. An ADB-funded twinning arrangement between PPWSA and Viet Nam's Binh Duong Water Supply Sewerage & Environment Company Limited (BIWASE) identified priority areas for improvement of BIWASE operations, trained BIWASE personnel in priority areas of water supply operations, institutionalized a system of process benchmarking and monitoring measurable improvement in two or more areas of operations.

4.6 Transparency

PPWSA implements a policy of transparency. The utility produces and distributes progress reports and performance indicators on a regular basis. Every three months PPWSA's administrative council reviews results and priorities. Results are then transmitted and commented upon by the DG to all staff members. Every year the authority's accounts and procedures are subject to an audit carried out by an independent international auditor. Transparent procedures in turn foster government, civil society and donor confidence in the utility. Internally, a set of indicators are used to understand the overall performance and department level performance on a monthly basis. A total of 148 indicators are used for evaluation. Externally, data is shared with benchmarking organizations like Southeast Asian Water Utility Network⁵.



The staff members of PPWSA played a crucial role in changing the work culture.

⁵ The South East Asian Water Utilities Network (SEAWUN) is a regional association of water supply and sanitation utilities and national water associations created to help its members improve their services. They have their own benchmarking programme.

Box 4 : What does staff of PPWSA say?

Sar Davy, Team leader, Head of Cashier Department and Information Desk, employee since 1993

Sar Davy is responsible for registering complaints, providing information to customers and potential customers, and directing complaints to relevant departments. Davy, who has been part of the reform process, believes that her department's role is important as information-sharing with consumers is an important management aspect. "By sharing information and listening to customer complaints, we help in reducing tension for the management, as we control customer's anger." Before the whole CRO was established, relations between customers and PPWSA were distant, but now the customer-PPWSA relationship has improved dramatically and the team can handle grievances better.

Huot Sok Heng, Head of Training Section, employee since 2004

Huot Sok Heng, a graduate in management studies, joined PPWSA at a secretarial level. His skills were noticed by the management, and he was shifted to the training unit. He underwent training in Japan and Viet Nam which honed his skills. He believes that PPWSA received this recognition because of training for staff members. He says, "Human Resources can only be developed through intense training, and this can change an institution."

S Kheng Lin, Director, Commercial Department, employee since 1993

S Kheng Lin, who has been with the PPWSA management since it was revamped, mentions that it was a very difficult time in 1993. But due to the presence of a strong leader, Ek Sonn Chan, reforms could be undertaken. New policies were formulated for each department, and everyone was encouraged to implement them. The whole team rallied around the Director General and to affect the changes. The management has a disciplinary committee that is strong and takes decisions to punish errant staff members as and when required, and it produced results. Lin says, "The leaders must be the models, and when a leader is honest and is ready to sacrifice, every subordinate follows the leader."

Roeun Nary, Head of Administration and Human Resources, employee since 1992

Roeun Nary, who handles human resources along with administration within the PPWSA, says that if all of the staff works hard, then there will be further improvement, which helps in making wise decisions. She has been with PPWSA from 1992 and spent a few years with the Commercial Department before moving to HR. The Director General played a critical role in turning round the fate of the utility within one year. Most of the decisions taken have been positive in nature. She says, "Staff in PPWSA are very happy. They work hard and are rewarded with good salary and incentives."

Tan Bun Neth, Head of Phum Preh treatment plant, employee since 1992

Tan Bun Neth says that a lot has changed since 1992. A lot of the old machinery has been replaced, and all the pump sets are 100% new. "The introduction of new technologies and machinery has made my job much easier," he says. He also feels that as demand has gone up, he is busier now than before, but O&M is more efficient now.



5 | PPWSA: Production and Operations

5.1 Infrastructure operation and maintenance

PPWSA owns three treatment plants located in different parts of the city, sourcing water from the rivers of Phnom Penh. The whole process is automated from the intake point in the network to the distribution points using a supervisory control and data acquisition (SCADA) system. The transmission and distribution network is 1,650 km long, consisting of pipeline networks reaching to the consumers' houses⁶. There are telephone and radio communication systems in each treatment plant that help to regulate the pumps, maintain pressure, identify leaks and solve them. Pressure is checked every hour. There are seasonal pressure drops, maximum water production is in June, which is the dry season, and then there is a gradual decrease in production. There are mechanical maintenance teams at each treatment plant, and a single electrical team at the central office. There are routine maintenance schedules. For example, there are programmes for monitoring water meters ([See Box 5: Water meter maintenance programme](#)) and leak detections ([See Box 6: Leak detection process](#)). After each check, an evaluation report is prepared. The procurement of equipment and fixing of problems is taken care of by the Production Department, and only costly equipment like pumps are referred to the DG. PPWSA pumps have been running smoothly for 10 years.

Customers are informed about any maintenance works to be undertaken. If a maintenance task requires more than an hour, then the task is carried out at night, but if takes a lesser time, like leak repairs, the works are carried out immediately.

Box 5 : Water meter maintenance programme

In the case of the water meter maintenance programme, periodic maintenance is undertaken as follows:

- Set up water meter control programme:
 - Every year for water meter with a diameter of 15 mm and 20 mm with Index $\geq 10,000 \text{ m}^3$
 - Every 6 months for customers with a water meter diameter of $\geq 25 \text{ mm}$
 - Every 3 months for customers suspected of fraud
- Set up water meter cleaning programme at the same time with distribution pipe cleaning
- Set up water meter calibration principle

⁶ Previously, overhead tanks were used for supplying water as the pressure was low. This has been discontinued now, since, due to higher pressure, water can be pumped directly to the piped network.

Box 6 : Leak detection process

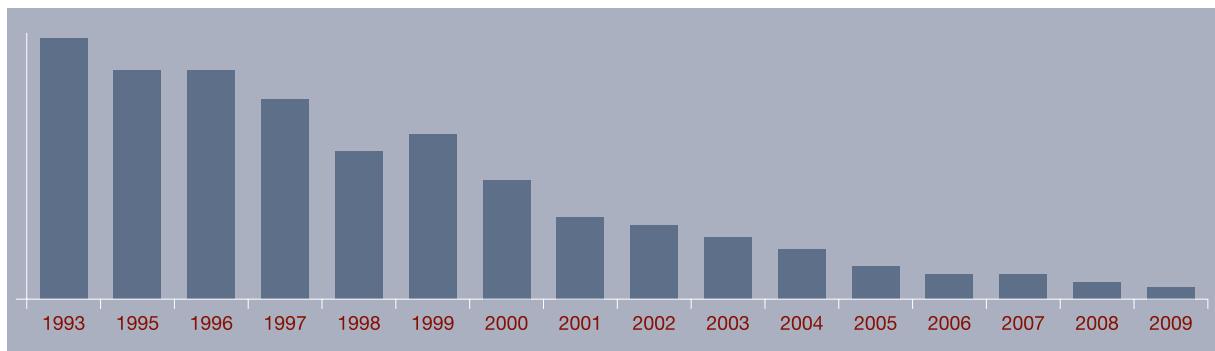
PPWSA has designed a leak detection process specific to their requirements and available resources. The Leak Detection Campaign started in 1996 with the support of an external expert. PPWSA uses a telemeter system at the Production Department, which detects high leakages and illegal connections in different zones. There are 58 sub-zones that have a local leak detection system. There is a 24-hour team present for leak repairs, and response time is two hours after the complaint is registered. Each repair has to have a follow-up report. The leak detection and repair teams work in tandem. Metering has been structured under a District Metering Area with each district having one team. The number of personnel in one team is dependent on the number of customers being served in one district. There are two engineers in a leak detection team. Each leakage control team is offered incentives based on a percentage of reduction of leaks. There is a NRW committee that reviews all leakage works. They measure the ratio at the beginning and at the end of the year. If the team performs inefficiently, however, then it receives a penalty. This structure allows for a certain amount of competitiveness among the leak detection teams. Each staff member in the leak detection team has signed a contract for incentives and penalties.

This system has allowed significant improvements in NRW. In 2000, the NRW ratio was 32, but the current NRW ratio is less than 6, a massive improvement that makes it one of the best levels among water utilities in the world (See Chart 6: Falling NRW).



PPWSA Leak Detection Campaign has been very successful in reducing non-revenue water.

Chart 6 : Falling NRW



Source: PPWSA records

5.2 Infrastructural and technical changes

In 1993, the overall process of running the water utility was manual and based on old, non-digitized technologies. There was no computerized monitoring, and it was difficult to detect leakages or monitor a large coverage area. Finances and administrative filing systems were manual and involved tremendous amounts of paperwork. Once the change process started, information technology was given priority, and most of the works, both technical and administrative, were computerized. Process control was shifted to the SCADA system, where a computer system monitors and controls the process. In 2003, an accounting information system was introduced to handle the finances of PPWSA. Staff members were trained to



A well equipped laboratory ensures that the water is safe.

operate the new system, which was received with enthusiasm after initial doubts. Water treatment plants are semi-automated and that has reduced the number of staff needed to run them. PPWSA has even restored a 1963 water treatment plant. There were 1,945 underground tanks in Phnom Penh, over which the PPWSA had no control. They have now been closed down⁷.

Overall in the production unit, the utility has:

- Metered all its connections and upgraded from Class B to more accurate Class C water meters
- Replaced old pipes
- Eliminated underground tanks
- Divided the distribution network into zones, each equipped with a pressure and flow rate measuring system
- Installed a data transmitter that monitors online data for analyzing big leaks in the system



Old pipes have been replaced across the city while new meters have been installed.

⁷ Illegal underground tanks were used by households, and it was very difficult to monitor the amount of water consumed or control the quality of water in such tanks, which numerous households were using. After the PPWSA decided to determine the magnitude of the problem posed by these underground tanks using a survey conducted in 1994, it made a policy decision to close them as quickly as possible and to provide every household that had depended on them with water through individual house connections. When this was not possible for a few specific cases, a caretaker was nominated for each tank and was provided with a meter. The caretaker was considered to be a local vendor-cum-retailer and had to pay the PPWSA for the total water consumption from the tank at the prevailing domestic rate. He then collected the funds from the consumers, which gave him some net income after paying for the water to the PPWSA.

5.3 Future directions

PPWSA aims to work towards the Millennium Development Goals and is currently supplying safe water to 90% of the urban population. PPWSA is planning to sustain this until at least 2030. Phnom Penh's population is expected to increase to 2.3 million by 2020 and 3 million by 2034. The current infrastructure and production capacity will not be enough to sustain this future demand. PPWSA has started working towards increasing production capacity by implementing a Stage II Priority Project. It is also expected that the PPWSA will become the Phnom Penh Metropolitan Water Supplier by 2020, as coverage will reach districts in other provinces. The current 450 km² coverage is expected to reach 1,500 km². The 2005-2020 Master Plan includes a five year business plan in which investment in the water supply sector has been identified.



PPWSA has started to march ahead from the urban core and increase coverage into the peri-urban areas.



6 | PPWSA: Customer Service and Community Contacts

6.1 Connection and reconnection procedure

Customers can pay for connection on site instead of at the main office. The poor living in slums are given certain privileges. For example, they are allowed to pay in installments within 10 to 20 months during which interest is charged. There is a 30% subsidy for the poor that is cross-subsidized by others. The cost of a single residential connection is 140 USD. In slum areas, where the people are mostly not literate, PPWSA team members go there to explain the process and also to help in filling out the forms.

Internally, the Commercial Department is responsible for connections. Once the application for a new connection reaches the Commercial Department, the chief of the Technical Section is informed and then an appointment for measurement is made. The measurement agent goes to the customers' premises and after the relevant measurements are calculated, prints a connection invoice and collects the connection fee from the customer. A date is fixed for the connection, and the field staffs visit to make the connection. A connection takes about a week, but in the case of slums the period is about 10 to 15 days. This delay is due to procedural requirements regarding installments that the customers from low income households require⁸. The matter has to be referred to the Fund Management Committee, which makes a decision. Within three days, the new customer's database is created. A connection team for each zone has 10 members led by a team leader from PPWSA, while the connection labourers are contract workers. The team leader is responsible for recruitment of the labourers.



Every one gets water 24x7.

⁸ All connections are household tap connections

Previously water was sold by water vendors at an exorbitant rate, but with PPWSA's supply reaching the customers, customers' water bills were reduced drastically. Some of the peri-urban areas, however, are still buying water from local vendors who source water from PPWSA. This is due to the lack of road and distribution infrastructure which hampers PPWSA's extension plans. These vendors are termed 'whole-sellers' by PPWSA ([See Box 7: Whole-sellers' story](#)). Many of the customers are not happy with this arrangement and want PPWSA connection. This shows that water costs less when one accesses it from the water utility network in comparison with private vendors, and consumer satisfaction is also higher ([See Box 8: Consumers speak](#)).

Box 7 : Whole-sellers' story



PPWSA calls them whole-sellers. They are the water vendors of Phnom Penh who supply water to the people who do not have access to PPWSA water due to the lack of a piped network. Their service area is mostly located on the peri-urban areas of the city, and their consumer base includes the poor and industrial labourers. These whole-sellers, however, have a link with PPWSA as they buy water from PPWSA at the pre-determined PPWSA commercial rate and sell at a price determined by the whole-seller.

Chom Chao commune located in Dang Kor district near the international airport of Phnom Penh is predominantly an industrial zone. Most of the residents here are workers of the adjacent factories. The colonies do not have paved roads, making it difficult for PPWSA to lay their distribution network. The whole-seller steps in here. There are a total of 110 families in the locality and there are two whole-sellers who sell at the same

price. Soum Ean is one such whole-seller who sells water in Chom Chan commune to 77 households. In an average month, he buys about 800 m³/month (rate is 1500 Riel per m³ which is the commercial rate) and makes a bi-monthly payment of 790 USD. He sells the water at the rate of 0.6 USD (2500 Riels) and on an average, in a month he earns about 300 USD. The whole-seller is responsible for installing meter at own cost and supplies water to customers mostly via PVC pipes or sometimes small tankers. PPWSA signs a contract with the whole-seller under which vendors like Ean can sell water to people at a price of their choice.

Ean, who was a middle man in land dealings, shifted to the water business in 2008 because he finds it more profitable. Initially, he had four connections from PPWSA but as PPWSA changed its connection rules reducing it to one connection per consumer, he now has one connection only.

Most of Ean's customers are, however, not happy and prefer to have a direct PPWSA connection. Customers like Kao Vhouch Lang, who works in the nearby textile factory lament that they are paying much higher than the PPWSA rates and they do not get regular water supply.

Box 8 : Consumers speak

Bodeng building, Tonle Bassan: There are nearly 100 families living in this squatter block, which the authorities consider illegal.

Kim Sacy; resident since 1999, four-person family

Kim Sacy has no access to a PPWSA connection because she could not afford the connection fee. She buys water at 0.84 USD or 3,500 Riel per cubic metre (m^3) from a water vendor who gets water from PPWSA and sells to residents without access to a PPWSA connection. In Sacy's neighbourhood, there are four water vendors who also reside there. They have legal connections from PPWSA, and they also sell water to the residents who do not have access to PPWSA connection. Water is pumped by the vendors to Sacy's house, and they have 24 hour access to water. Meters have been installed too. Houses located in the upper stories of the buildings have problems with the pumping of water.

Sacy, her entire family of four members, and their grocery shop use about $11 m^3$ of water per month. Sacy and her neighbours find the quality of water good, but they are hesitant to use the water for drinking. They either boil the water or buy 20 litre water bottles which costs 1 USD or about 4,000 Riel. They consume about six to eight bottles of water per month in the rainy season, while the number increases to 10 during the dry season. One reason people are using bottled water is the lack of the odour that is prevalent in PPWSA's water due to chlorination. Now, Sacy has enough money and has applied for a PPWSA connection which will cost her 10.92 USD or 45,000 Riel. Sacy believes that public water is cheaper than private water.

Chim Kosal, resident since 1999, four-person family

Chim Kosal and her family of four members are also dependent on a private vendor for water. They use about 3 to $4 m^3$ of water per month. They have a storage tank which is connected to the vendors' pipeline. They are interested in getting connected to the PPWSA line but are hesitating as there are rumours that their colony (slum settlement) maybe removed from its current location because the authorities consider it illegal. Their application for an electrical connection was rejected.

Kosal's family does not drink bottled water as they detected the presence of sediments in the water. They boil water for drinking. She considers that the water vendors are a mafia as they are the richer families of the slum. All vendors have an arrangement by which they allocate water. People have to control the usage of pumps and meters. A meter costs 5 USD, which Kosal and others who get water from vendors have to buy themselves.

Chay Sarom, resident since 1982, four-person family

Being a long-time resident, Chay Sarom has seen the transformation and has shifted from dependence on private water vendors to PPWSA. Sarom and her family of four depended on water vendors previously, but from 2005, they are customers of PPWSA. They paid about 10 USD or 40,000 Riel for the PPWSA connection. They store water in a tank. Sarom says that buying water from the private vendors was expensive and the family limited their water usage to 5 to $7 m^3$ per month, whereas now they are using much more water and paying less. Also, payment to private vendors had to be made every month, but payment to PPWSA can be made once in two months. Apart from the PPWSA connection fee, she had to pay for a meter and pump which cost about 100 USD or 400,000 Riel. The payment was made to PPWSA in installments. Sarom and her family has never uses bottled water and boil the PPWSA water for drinking. They do not face any health problems.

Box 8 : Consumers speak (continued)

Village 8 has eight separate villages and is a mixed area of poor and middle class residents.

EM Mong, village chief, resident since 1998, 10-person family

EM Mong is 70 and is the village chief. He has a big family of 10 members and so depends on both PPWSA and rainwater. He is paying about 7.5 USD or 30,000 Riel every two months to PPWSA for the consumed water, and to save on the bill, he has installed a rainwater harvesting system. He is paying about 0.13 USD or 550 Riel per m³. The price has increased over the past 10 years from 0.08 USD or 350 Riel. Children in Mong's family use bottled water for drinking while adults use boiled water.

Village 16 is a squatter colony near a railway track.

Soy Nadjy, resident since 1999, seven-person family

Soy Nadjy received her PPWSA connection in 2005. Previously she was paying about 2,000 Riel for one 20-litre drum of water to vendors and was using about three drums daily. She has a sewing and tailoring shop that requires more water. In one month, she was paying 150,000 Riel or 37.5 USD for water. In 2005, residents of the locality urged PPWSA to extend their network to their squatter colony, which the PPWSA did. Now, Nadjy pays 15,000 Riel or 4 USD per month for water – that is, ten times less than before. It has helped her to reduce costs tremendously. Before the PPWSA connection, they did not have 24-hour water connection and used to receive water only at night because the slum is located at a higher elevation. In 2008, the situation changed as PPWSA improved its network, and they now have a 24-7 water connection.



With its innovative tariff process and distribution network, even the poor can now afford safe water in their house.

Out of 152,000 connections, there are 14,000 poor families getting direct access to PPWSA piped water. PPWSA's programme called *Clean Water for the Poor* launched in 2000 helped to increase connections. This was possible after the NRW level dropped, thus leading to more water in the supply network, and the total revenue was enough to cover the cost ([See Box 9: Poor consumers' access to water](#)). This helped in reducing the burden on women and children, allowing them to have more time to assist in community affairs. Besides that, clean water could also prevent many diseases. Regarding commercial, institutional and industrial connections, the customers have to approach the PPWSA office.

Box 9 : Poor consumers' access to water

To bring the poor into the coverage network, PPWSA initiated a campaign called Clean Water for the Poor. This was initiated in 1999 when PPWSA had total revenue higher than the costs and the NRW dropped, resulting in more water in the network. Under this campaign, poor communities are provided with clean water via installment payments and subsidies. They get a subsidy in terms of house connection and also consumption fees. Regarding the consumption fee, the progressive water tariff helps. The average tariff is about 0.24 USD per m³, which is well within the average family's purchasing power. A poor family's average monthly water bill is about 1 USD for 7 m³ of water and accounts for around 4% of such a family's monthly income of around 25 USD on average. Water bills declined by a factor of 5-6, for a vastly improved service for the city's poor. Private water vendors have disappeared from the PPWSA area, and people, including the poor, are willingly paying a higher tariff.

The process of getting the poor connected went through a lot of experiments. The first experiment determined specific communities of poor people, who then elected community representatives to whom PPWSA sold water, and then resold it to their respective communities at a tariff recommended by PPWSA. The system did not perform as expected because the community representatives mostly sold water to the poor people at 10-20 times the subsidized rate.⁹

In March 1998, PPWSA received a soft loan from the World Bank, a part of which was earmarked for the provision of clean water to the poor. PPWSA stopped using the community representatives and started supplying water to the poor households directly. This arrangement did not work very well, primarily because the necessary information was not properly disseminated to the poor households. In 2000, two work teams were formed for better dissemination of information. They were also responsible for implementing the entire programme. It improved the number of water connections to the poor families to 474 that year. In 2001, the PPWSA carried out a survey of the views of the households that had received the connections and also those that did not about its "water supply for the poor" programme. This survey identified two fundamental problems:

1. Poor families found it financially difficult to pay connection fees in 10 monthly installments, and
2. People were still not aware of the programme and its potential benefits.

At present, because of a grant by the International Development Association (IDA) and depending on the poverty levels, poor households are entitled to receive subsidies of 30%, 50%, 70% or 100% of the connection fee, depending upon their financial conditions. These conditions are jointly evaluated by a committee of PPWSA and the local commune representatives. In addition, those households that consume a maximum of 7 m³/month, had to pay only 60% of the real cost of providing water. This new policy has helped poor households to save between 31 USD and 91 USD. As a result of these improvements in the pro-poor policies, the number of poor households that were connected to the system has steadily increased each year.

⁹ Adopted from Biswas et al 2009, Water Supply of Phnom Penh: A Most Remarkable Transformation- annexure, Third World Centre, Mexico City

On non-payment of charges, PPWSA has a policy to deal with these situations. If a customer does not pay the amount due, a warning is conveyed to the customers with a 15 days deadline. Even after the first warning, if the customer fails to clear the dues, a second note is sent informing that within this date, if the payments are not made, then the customer will be disconnected from the network. To get back the connection, the customer has to pay the outstanding amount and also pay a penalty of 1% of the amount per day along with a reconnection fee of 14.50 USD or 60,000 Riels. On further default or delay in payment, the reconnection fee increases to 24 USD or 100,000 Riels. After this, the reconnection is made. Such customer details get automatically updated in the database.

6.2 Consumer billing and grievances

Within the department of PPWSA known as the Cashier Department, the billing and consumer desk is responsible for collecting charges and filing consumer complaints, and also acts as an information desk. The department has its office located within the PPWSA complex where people come to pay their bills. Recently, four collection and complaint registration kiosks have been opened in four zonal branches within the city. There is one bill collector and one complaint registration officer manning the desks.

Bills are issued by the Commercial Department, whose staff members observe the meter reading and then send readings to the Computer Department. The printed bills go to the Revenue Department, which issues the bills to the customers. Bills are issued bi-monthly. The collection ratio is high as all bill collectors are given an incentive or penalty. A higher percentage of collection of water bills leads to a higher payment for collectors. If a collector receives less than 97% of the bills for three consecutive billing periods, then the concerned collector is penalized or removed.



Customers can pay their bills with ease.

Regarding filing of complaints by consumers, people can lodge complaints by visiting the complaints registration desk or making a phone call. Staff members working on this desk say that most people come in person to make a complaint, and it helps in understanding the problem better. There are two people handling the desk that has a list of complaint categories, which are filed under the relevant category and then forwarded to the concerned line department. Complaint categories include issues relating to water consumption, connections, metering and leakage among others. Accordingly, the relevant complaint is directed to the line department. For instance, if there is a problem related to water leakage, then the matter is reported to the Team Leader of the metering and leak detection unit. Following this, the line department takes the necessary action. If the consumers are not satisfied with the answers or if there are issues that need actual departmental handling, then the consumers are taken to the concerned department.



PPWSA staff members are always there to handle customers' grievances.

The customer complaints are also sent to the data entry department for the purpose of records. On an average, the PPWSA office complaints desk receives about 30 to 50 complaints per day. The desk also provides information as requested by customers through various booklets and leaflets. Field staff is also provided with information leaflets to share information with customers.

There is a customer database which helps in identifying the customer code and other details including queries and remarks section. The database was created in 1994, and in 2002, PPWSA shifted to a more updated database system called NAVISION. The database is very up-to-date. PPWSA launched a massive customer survey to identify customers and create a database. It took one year with 100 PPWSA staff members visiting residents of Phnom Penh to build the database¹⁰.

6.3 Awareness campaign and community contact

PPWSA initiated an information campaign with direct interaction with the consumers to make people aware about the procedure to obtain new connections, on water tariffs, subsidies, the penalty system regarding illegal water connection, non-payment of bills, quality of water, grievances and redressal, and other service-related issues. Information leaflets include material on the process of water production, treatment and distribution to assure the consumers about safety aspects. PPWSA staff members also demonstrate the safety of the water by drinking it in front of the consumers. Household handling of water is also part of the campaign. The process for making an application for water supply is also explained. The PPWSA website is regularly updated with the latest information. There is an information desk which also receives complaints. The head of the information desk is invited to all PPWSA meetings and is updated on various departmental changes by the management.

For accessing local communities, PPWSA contacts the community leaders via the local commune who in turn informs the customers, and a date and venue is decided for the awareness campaign session. There is a list of criteria to identify the poor, and PPWSA takes help from local NGOs to identify poor households. NGOs also help during the process of laying pipe lines among poor communities.

¹⁰ The survey found that 12,980 households were not connected to the system but were paying bills. In contrast, they were 13,901 customers who were connected and receiving water, but were not in the list and thus were not being billed. They were receiving free water.



7 | Conclusion

This case illustrates that a public sector utility can implement a management approach more akin to that of a private sector company based on results and incentives. The success of PPWSA is a result of several factors including a General Director with sufficient vision and leadership to push through a culture of change, a desire for change at the local political level, sufficient autonomy to be able to implement reforms as well as donor backing and shared objectives between line ministries, employees and donors. The culture of change, implemented by PPWSA, focused first and foremost on employees, particularly on education, motivation and, when necessary, sanctions. Clear and transparent operating procedures mean that employees know where they stand. The utility's regular publication of performance indicators and activity reports is a part of this transparent approach and demonstrates the importance placed on accountability and results. Massive improvements in operational efficiency were made by an internally driven set of incentives, penalties and disciplines, and a high emphasis on training. The utility has not only generated change within the company but also among consumers and civil society by building an awareness campaign and interactive sessions with PPWSA staff members. In addition, PPWSA's implementation of the programme "Water for the Poor" aims to ensure that even those who cannot afford to pay the full cost still get access to clean water. One of the traditional obstacles to extending coverage, namely tariffs below operational costs, has been largely overcome, and the imaginative use of the revolving fund has helped with transitional problems for poor consumers¹¹. Consumers were informed about water tariff, connection procedure, billing, and complaint procedures with the help of local communes, which helped to build a positive relationship between the service provider and consumers.

Covenants with International Financial Institutions (IFIs) were used as guides to improve the water utility, but these covenants need to be relevant to local situations. The government explicitly made this financial commitment to both the ADB and WB when it sought loans from these two institutions for modernizing and restructuring PPWSA and for rehabilitation of its old infrastructure and construction of new ones. The reform worked in an internally generated fashion with local leadership, but the role of donors was very important in terms of technical assistance and access to finance. The availability of finance from IFIs actually strengthened the autonomy of the municipal service, because it made it less dependant on central government.

The strategy of cost recovery was implemented not only by increasing tariffs but also by focussing on billing rates (the proportion of customers that receive a bill) and collection rates (the proportion of bills that are actually paid). The successful accomplishment of these plans led to less reliance than anticipated on tariff increases, making the third of three planned price increases unnecessary. This reduced the price obstacles for the poor to manageable proportions. The strategy of cost recovery was also successful in reinforcing autonomy.

¹¹ Revolving fund was set by funds from WB and from the Mayor of Paris that helped in using the funds to subsidize the poor



PPWSA has established an efficient process and the path is to sustain it from here.

Though the PPWSA case is one of the best models for urban water management, one type of model will not be suitable for all developing countries. Developing countries are not homogeneous and are at different stages of economic, social, legal and institutional development. In addition, at least in terms of water supply, climatic conditions may vary quite significantly from one city to another, even within a single medium-to-large size country, and the availability of water infrastructure is seldom uniform ([See Box 10: Takeaways](#)).

Box 10 : Takeaways

- Appropriate policies with political support
- Donor support and involvement
- Proactive leadership
- Autonomy
- Motivated employees
- Incentives for staff
- Training of employees
- Discipline among staff
- Operational efficiency
- Assets investment
- Low NRW
- Extensive coverage including the poor
- High production
- Adequate pressure in pipeline
- Prompt maintenance
- Tariff reforms
- Cost recovery
- Financial sustainability
- Up-to-date database
- Proactive grievance cell
- Accurate billing process
- High collection ratio
- Customer outreach
- Awareness generation
- Inspection and auditing
- Transparency

The challenges that remains for PPWSA are to complete its sewer service and bring it up to the degree of coverage of the drinking water service, and also to extend coverage to the outlying peri-urban areas where this has not yet been done.

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Annexure

Annex 1: Project for subsidizing domestic water connections to low-income residents

I Criteria to identify the poor

Description	Score
A Householder status	40
A-1 Widow without regular career (large numbers of children with old mother or father)	6
A-2 Widow is employee (large numbers of children with old mother or father)	5
A-3 Retired employee (with large numbers of children in school)	4
A-4 Disabled (ex-soldier), no regular career	5
A-5 Elderly without support and large numbers of children of unemployable age	4
A-6 Single mother or father with large numbers of children	4
A-7 Ill with chronic disease and cannot work	4
A-8 Large numbers of school-age children	4
A-9 Elder orphan who acts as head of house	4
B Housing conditions	30
B-1 House columns are made of small wood or house is sitting on the ground	4
B-2 Walls are made of bamboo, palm leaf or plastic tenting	4
B-3 Roof is made of palm leaf, plastic tenting or deteriorated galvanized sheets	4
B-4 Many families live in one house as relatives or others	4
B-5 House built on roof "terrace", with walls made of bamboo or palm leaf or plastic tenting 4	
B-6 Poor sanitary conditions around house/no latrine	2
B-7 No water source or water source is far away	2
B-8 House is very small in relation to the number of family members	4
B-9 No electricity or using battery	2

Description	Score
C Assets	10
C-1 No means of transportation to do business (cart, motorcycle, bicycle, etc.)	2
C-2 No livestock (buffaloes, cows, pigs, etc.)	1
C-3 No television, tape, radio or other such items	1
C-4 No mosquito net or has insufficient quantity for the household	1
C-5 No bed, table, cupboard, chair or has improvised items	1
C-6 No/little land for cropping	2
C-7 No water well	1
C-8 No cash savings for emergency	1
D Access to economic assets	10
D-1 No regular job	3
D-2 Household income about 1 USD/day (ask the number of working persons in and determine the total)	2
D-3 Children under age 16 cannot attend school (check reason)	3
D-4 In debt to others for buying food and necessities (check reason)	4
E Access to social assets	10
E-1 Householder is illiterate	1
E-2 Adult members are illiterate	2
E-3 Children cannot attend school or do not regularly attend (check reason)	3
E-4 No job due to chronic illness	4

II Payment Scheme

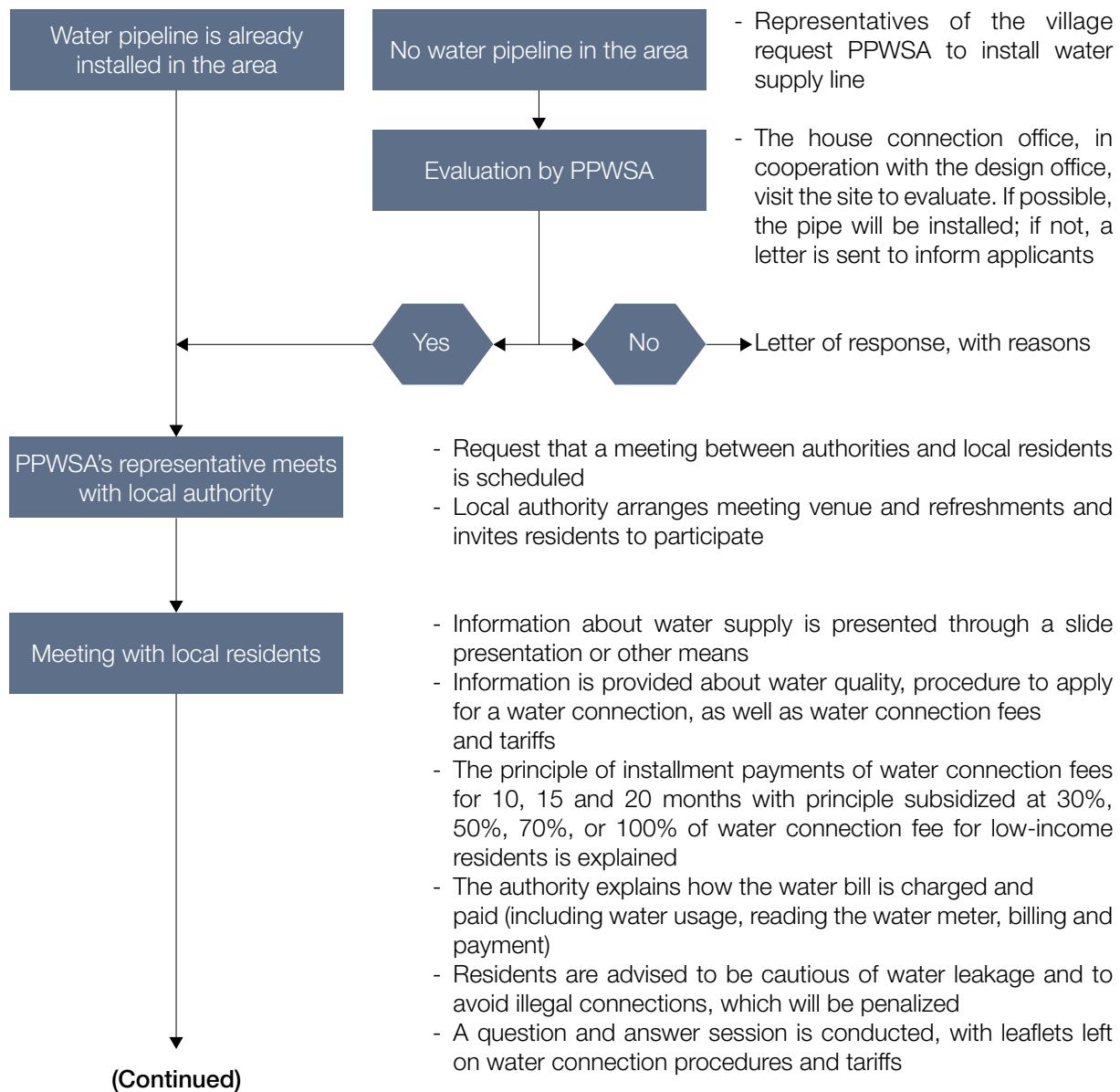
Poor residents will receive different discounts and payment schedules as follows:

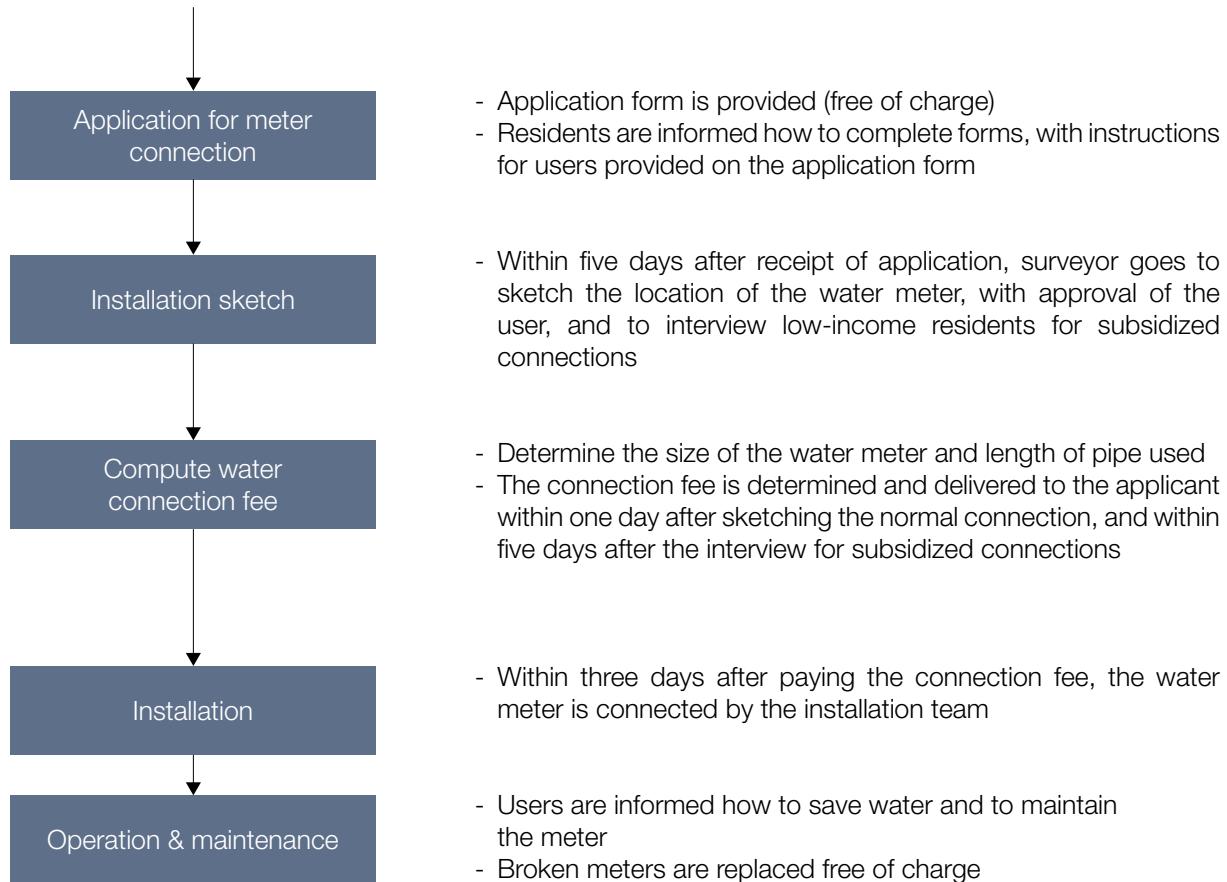
Group A: Water supply connection fee discounted by 30%, with the balance of 70% to be paid by the customer along with their monthly water bill over a number of months (10, 15 or 20 months). The discounted portion (30%) is funded by the Social Account within PPWSA.

Group B: Water supply connection fee discounted by 50% with the balance of 50% to be paid by the customer along with their monthly water bill over a number of months (10, 15 or 20 months). The discounted portion (50%) is funded by the Social Account within PPWSA.

Group C: Water supply connection is provided free of charge, with 100% of the connection fee funded by the Social Account within PPWSA.

Annex 2: Household water connection procedures





Annex 3: PPWSA staff evaluation forms



P.P.W.S.A

Kingdom of Cambodia
Nation Religion King

* * * * *

Work Performance Evaluation Form For Managers of Office

Quarter of Year

Name:

Current position:

Department: Office:

1. Behaviour

- | | | |
|---|--|--|
| a. Appearance : <input type="checkbox"/> Very good (4-5pt.) | <input type="checkbox"/> Suitable (3-4pt.) | <input type="checkbox"/> Not suitable (0-2pt.) |
| b. Behaviour : <input type="checkbox"/> Very good (4-5pt.) | <input type="checkbox"/> Good (3-4pt.) | <input type="checkbox"/> Poor (0-2pt.) |
| c. Speaking : <input type="checkbox"/> Most gentle (4-5pt.) | <input type="checkbox"/> Gentle (3-4pt.) | <input type="checkbox"/> Less gentle (0-2pt.) |

2. Work capacity (inside PPWSA)

- | | | |
|---|---|--|
| a. Competency/skills : <input type="checkbox"/> Sufficient (13-15pt.) | <input type="checkbox"/> Fair (7-12pt.) | <input type="checkbox"/> Poor (0-6pt.) |
| b. Achievement : <input type="checkbox"/> Every time (13-15pt.) | <input type="checkbox"/> Sometimes fail (7-12pt.) | <input type="checkbox"/> Poor (0-6pt.) |
| c. Solidarity : <input type="checkbox"/> Very good (13-15pt.) | <input type="checkbox"/> Fair (7-12pt.) | <input type="checkbox"/> Poor (0-6pt.) |
| d. Work relations : <input type="checkbox"/> Very good (13-15pt.) | <input type="checkbox"/> Good (7-12pt.) | <input type="checkbox"/> Poor (0-6pt.) |
| e. Hierarchical respect : <input type="checkbox"/> Very good (13-15pt.) | <input type="checkbox"/> Good (7-12pt.) | <input type="checkbox"/> Poor (0-6pt.) |

3. Social activities (outside PPWSA)

- | | | |
|--|--|--|
| a. Local living conditions: <input type="checkbox"/> Very good (4-5pt.) | <input type="checkbox"/> Good (2-3pt.) | <input type="checkbox"/> Poor (0-1pt.) |
| b. Participation in social activities: <input type="checkbox"/> Very high (4-5pt.) | <input type="checkbox"/> Fair (2-3pt.) | <input type="checkbox"/> Poor (0-1pt.) |

Phnom Penh, Date:

Bearer's Signature

Director's comments:

.....
.....

Phnom Penh, Date Signature

Director General's comments:

.....
.....

Phnom Penh, Date Signature



P.P.W.S.A

Kingdom of Cambodia
Nation Religion King

* * * * *

**Work Performance Evaluation Form
For Chiefs of Section and Vice Managers of Office**

Quarter of Year

Name:
Current position:
Department: Office:

1. Behaviour

- | | | |
|---|--|--|
| a. Appearance : <input type="checkbox"/> Very good (4-5pt.) | <input type="checkbox"/> Suitable (3-4pt.) | <input type="checkbox"/> Not suitable (0-2pt.) |
| b. Behaviour : <input type="checkbox"/> Very good (4-5pt.) | <input type="checkbox"/> Good (3-4pt.) | <input type="checkbox"/> Poor (0-2pt.) |
| c. Speaking : <input type="checkbox"/> Most gentle (4-5pt.) | <input type="checkbox"/> Gentle (3-4pt.) | <input type="checkbox"/> Less gentle (0-2pt.) |

2. Work capacity (inside PPWSA)

- | | | |
|---|---|--|
| a. Competency/skills : <input type="checkbox"/> Sufficient (13-15pt.) | <input type="checkbox"/> Fair (7-12pt.) | <input type="checkbox"/> Poor (0-6pt.) |
| b. Achievement : <input type="checkbox"/> Every time (13-15pt.) | <input type="checkbox"/> Sometimes fail (7-12pt.) | <input type="checkbox"/> Poor (0-6pt.) |
| c. Solidarity : <input type="checkbox"/> Very good (13-15pt.) | <input type="checkbox"/> Fair (7-12pt.) | <input type="checkbox"/> Poor (0-6pt.) |
| d. Work relations : <input type="checkbox"/> Very good (13-15pt.) | <input type="checkbox"/> Good (7-12pt.) | <input type="checkbox"/> Poor (0-6pt.) |
| e. Hierarchical respect : <input type="checkbox"/> Very good (13-15pt.) | <input type="checkbox"/> Good (7-12pt.) | <input type="checkbox"/> Poor (0-6pt.) |

3. Social activities (outside PPWSA)

- | | | |
|--|--|--|
| a. living conditions : <input type="checkbox"/> Very good (4-5pt.) | <input type="checkbox"/> Good (2-3pt.) | <input type="checkbox"/> Poor (0-1pt.) |
| b. Participation in social activities: <input type="checkbox"/> Very high (4-5pt.) | <input type="checkbox"/> Fair (2-3pt.) | <input type="checkbox"/> Poor (0-1pt.) |

Phnom Penh, Date:

Bearer's Signature

Director's comments:

.....
.....

Phnom Penh, Date Signature

Director General's comments:

.....
.....

Phnom Penh, Date Signature



About IUCN

IUCN, International Union for Conservation of Nature, helps the world find pragmatic solutions to our most pressing environment and development challenges. It supports scientific research, manages field projects all over the world and brings governments, non-government organizations, United Nations agencies, companies and local communities together to develop and implement policy, laws and best practice. IUCN is the world's oldest and largest global environmental network - a democratic membership union with more than 1,000 government and NGO member organizations, and almost 11,000 volunteer scientists in more than 160 countries.

www.iucn.org



About the Phnom Penh Autonomous Water Supply Authority

The Phnom Penh Autonomous Water Supply Authority (PPWSA) is in charge of producing and distributing of clean water for general uses for the city of Phnom Penh. PPWSA is a state-owned enterprise operating under commercial law.

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About Mekong Water Dialogues

The Mekong Water Dialogues (MWD) aim to facilitate transparent decision-making in the Mekong region by enabling wider stakeholder involvement in processes associated with water resources governance. MWD is dedicated to facilitating equitable water governance in the region through sustainable mechanisms that:

- improve decision-making processes around water-related investments in the Mekong Region;
- provide opportunities for business, government and civil society actors in the Mekong Region to participate in dialogues; and
- enable different perspectives on Mekong Region water-related development to be considered in decision-making.

www.iucn.org/asia/mekong_dialogues



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AFFAIRS OF FINLAND

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Finland supports bilateral and regional development cooperation projects and programmes in the Mekong region through its Ministry for Foreign Affairs.



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