

Public-Private Partnerships for Urban Water Supply and Wastewater Treatment: An overview of the concept of PPP and its applications for urban water

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In the summary of this report, we have already discussed about the Kitakyushu Initiative. This section of the report is divided into six parts. Firstly we discuss about the role of the Kitakyushu Initiative, which is focused to build the capacity of the local governments to overcome the urban environmental problems. Secondly we discuss about the public-private partnerships in general and for urban water in particular. Thirdly we analyse the presentations, which were made by the cities and the comments from the experts. Fourthly we discuss some of the successful case studies for public-private partnerships in urban water. Fifthly we discuss the major outcomes from other PPP based projects in different sectors. Sixthly we discuss the conclusion and recommendations of this seminar.

1. Basis for Kitakyushu Initiative

1.1 Urban environmental issues and “Sustainable Cities”

Urban population growth rates are higher in developing countries than the average national growth rates. Although most of the development agencies were undertaking rural development projects to improve the living standards in rural areas, the migration towards urban centres is a continuing phenomenon in the developing countries. Therefore, the realistic challenge for development agencies is not to halt the expansion of urban centres, but to address the challenges, including environmental issues, faced by the cities.

Sustainability is a debatable term and it can be defined from the specific point of view. For development and environmental specialists, we can define this term to provide the socio-economic and environmental services on self-reliance basis. Among these services, the sustainable urban environmental management is the biggest challenge in the developing countries requiring a lot of efforts to improve social and physical infrastructure. The investment in urban environmental services can yield higher benefits, as most of the urban environmental hazards affect the health of the people.

International development initiatives are trying to help the developing countries to meet these challenges. However, it is comparatively a recent approach to assist the local governments in place of national governments, as these are directly responsible for most of the urban environmental services. Furthermore, there is a growing trend to make local authorities independent. Moreover, now decisions are being made on demand responsive approach (DRA), to only invest for meeting the real demand from the users.

Kitakyushu Initiative for a Clean Environment also follows this trend. This initiative aims for capacity development of local governments to improve their urban environmental management. Under this initiative, various successful practices have been gathered and pilot projects have been initiated. This initiative can provide good input for development agencies to promote sustainable urban environmental management through capacity development.

Cities are facing various challenges including socio-economic, law and order, and environmental issues. Hence in a broader framework, all the challenges should be met on a sustainable basis to achieve the status of a “Sustainable City”. For different set of issues, the sustainability could be defined differently. When we tackle any of the issues for example crime control, education for all, pollution control, or provision of water supply, we come across different definition of sustainability. As our research is directed towards urban environmental management, our selection of the definition for sustainability is focused in this direction.

Different schools of thought define sustainability from their own perspective. Environmental economics, which is assumed as the core area for defining sustainability, also defines it at four different levels of sustainability from intra and inter generation equity point of view (Turner 1993). Here on the one extreme, very weak sustainability allows to convert natural assets into man-made capital. On the other extreme a very strong sustainability does not allow removal of any natural asset. Most of the investment decisions, involving sustainability, select different discount rates to take investment decisions, as high discount rates

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encourage the use of natural assets but the low or zero discount rates do not encourage the use natural assets. However, Summers (1992) observes that we should carefully incorporate all the costs and benefits and should do a good cost-benefit analysis, as this is more important than routinely lowering the discount rates.

For the development agencies, definition of sustainability also varies according to the basic foundations of the agencies. For example, in the World Bank, which is more of a bank, a project is sustainable, if the economic rate of return it generates is at least equal to, the opportunity cost for project's benefits. In USAID, which is a development agency, sustainability is a program's capacity to continue to deliver services or sustain benefits after the donor's technical, managerial, and financial support has ended. Therefore, this is what we can term as the "self-reliance" from long-term perspective of a project or policy.

The other important issue is of equity, as equitable treatment of all people within a community of users is often of equal concern, and policies that redistribute resources to poorer individuals are of considerable importance in developing countries where distributions of wealth are highly skewed (Ostrom et al. 1993). Due to equity as one of the aim for the environmental services, it is difficult for private sector to manage these services on basis of the free market philosophy. Hence local governments have to play an important role to maintain the equal distribution of the benefits within the community.

This clearly suggests that for moving towards "sustainable cities", we need to address the various issues including environmental management on self-reliance basis, without depending on aid or subsidies, and with equal distribution of the benefits.

1.2 Capacity building for local governments for environmental management

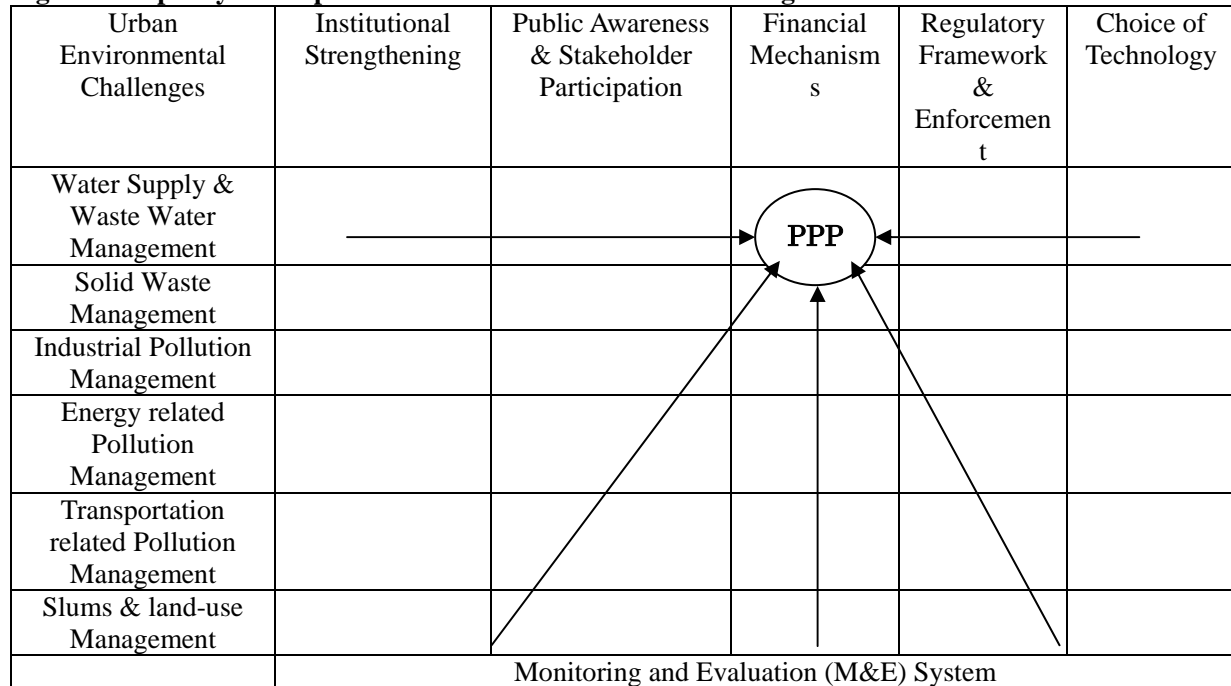
In urban centres, local governments or municipalities are responsible to provide the environmental services including water supply, sewerage, and solid waste management (O'Sullivan 2000). However, this is the biggest challenge for the municipalities, as most of the services in the developing countries are either not available or run into the problems due to weak institutions and due to scarcity of the resources. Hence the availability of optimal social and physical infrastructures is crucial factor for urban environmental management.

Ostrom et al. (1993) suggests that social infrastructure consists of institutions, which based on the people, and the patterns of regular, repetitive interactions among them transform inputs into outputs. The institutions include families, private firms, government agencies, local communities, NGOs, and so on. For urban environmental management, municipalities are playing a greater role; however, these institutions are not performing at the optimal levels due to various reasons. The most important aspects include the job description for the people, and incentives and accountability to perform up to the best levels. Then either there is no firm rules, regulations, and incentives to generate revenues, and to promote public-private partnerships, or their enforcement is an issue.

Provision and maintenance of the physical infrastructure has been a long-lasting challenge for the municipalities due to financial constraints, as most of the services require the cross-subsidies and due to budget deficits the required funding is not available. Apart from financial constraints, the lack of proper planning, designing, construction, and operation and maintenance also hampers the performance of the physical infrastructure. However, these problems are mainly linked with the social infrastructure.

Capacity development for environment is essential for providing sustainable environmental services. As shown in Fig 1, this covers institutional aspects, public awareness, and stakeholder participation, financial mechanisms, regulatory framework and enforcement, and choice of technology. Institutional aspects includes the management structure and the human resources, public awareness and stakeholder participation targets the enhanced role of all stakeholders to minimize the urban environmental issues by changing the production and consumption behaviour as well as by formulating appropriate policies, financial mechanisms include public sector funding and public-private partnerships mainly for urban environmental structure, regulatory framework and enforcement includes the jurisdiction of local governments to frame the regulations and/or to enforce these regulations, and choice of technology includes the promotion of appropriate technology that may suit well to the local needs. All of these means, to achieve sustainable development, are interlinked and complement each other.

Fig. 1 Capacity development for Urban Environmental Management



2. Public-private partnerships for urban water

This section aims to clarify the important issues, concerned with the PPP projects for urban water. The first part discusses the necessity of these projects due to the lack of public sector resources and the management inefficiencies leading towards insolvency. Then, the paper discusses the two most important aspects for the PPP. One is setting the appropriate tariffs to promote economic efficiency, equity, and cost-recovery, without the cross subsidizing within the urban water. The second issue defines the various types of PPP contracts and their usefulness

2.1 Necessity for public-private partnerships

The concept of public-private partnerships covers whole range of options involving private sector, including community ownership and management, to provide and/or manage the urban environmental services like water supply and wastewater treatment. We will discuss those options in the second sub-section on “contractual management.” Here first we briefly discuss the reasons to opting for public-private partnerships and in the next sub-section we will discuss the pricing and subsidy policies for making the investments viable.

Traditional public sector agencies have been facing many problems to provide water supply and wastewater treatment services. These problems include financial constraints for installation of the services, operating inefficiencies in terms of higher operation and maintenance costs and lower recovery for each unit of production, limited human and technical resources, and bureaucratic and political interference.

Municipalities in the developing countries usually do not have access to financial resources as either central or provincial government is collecting most of the taxes. Hence, the decentralization arguments also include the financial decentralization (Shah 1998). Municipalities should have enough resources either through tax collection system or through commercial activities to improve the financial resources. The municipalities with enough financial resources can only provide standard services, as huge capital investment is required. Furthermore, the investment in water supply and wastewater treatment services is bulky and payback periods are long; hence, even if the rate of return is reasonable, the municipalities cannot generate enough resources to support the expansion of these services to meet the demand. This problem has led to invite private sector investments under public-private partnerships.

The second problem is operating efficiency, as most of the public sector services are generating operating losses. There are two major reasons for this. One is higher operation and maintenance cost per unit of production. This is due to inefficiency in terms of human other resources engaged, corruption, obsolete technology with higher difference in input-output ratio. The other reason of operating inefficiency is lower recovery per unit production. This due to lower tariffs coupled with higher losses, which are unpaid due to either theft or lower motivation for recovery, or due to old pipelines that is also known as

system losses. Public-private partnerships may improve the operating efficiency, as the costs would be reduced with higher efficiency, and imposition and collection of tariffs would be improved.

The third major problem is the availability of human and capital resources. In comparison with the central and provincial governments, there are limited resources available to municipalities. The qualified persons are in short supply and technical capacity of the municipalities is also quite low. Hence, the performance of municipalities is quite low to manage some sophisticated works involving water supply and wastewater treatment. This problem of insufficient human resources is different from overstaffing, where the municipalities are over burdened with the staff, but most of that staff is not well qualified to perform the job. Public-private partnerships may bring qualified people and technical resources to get the job done well, as their financial investment is at the stake.

The problem of bureaucratic and political interference is also a major issue, which has lead towards the discussion for decentralization (Shah 1998). The officers in the municipality may also belong to provincial and central governments; hence, their transfer from one municipality to other or to the other agency can lead towards weak commitments. In most of the developing countries, projects and plans are known from their ownership; hence, political changes and the management change leave many plans inconclusive. Then, political leaders may influence their agenda on the municipalities, which might not be in line to make public services viable and self-sustaining. Furthermore, trade unions, most often, play a damaging role by asking for more pays and more staff to work in these services. Public-private partnerships are believed to be working without bureaucratic and political influence including trade unions. The major issues for all the financial mechanisms can be summarized as shown in Table 1.

Table 1 Major issues for various investment/management options

Public Sector	Private Sector	Public-Private Partnerships
Financial constraints	Public good (affordability)	Outreach & Affordable good
Operating inefficiencies	Operating efficiency	Operating efficiency
Losses & cost recovery	Tariff collection & cost recovery	Pricing and tariff
System expansion	Lumpy or bulky investment	Transaction costs
Human resources	Long payback period	Guarantees & incentives
Technology	Uncertainty and risks	Regulatory framework
Political influence	Borrowing guarantees	Sustainability
Centralized management	Entrepreneurship	Entrepreneurship

Although, it is been established that private-public partnerships can yield better results to provide standard services for most of the communities living in the urban areas; however, the questions remains how to motivate private sector and communities to form public-private partnerships. Here, we will look into the discussions on pricing regulations and tariffs, which is the basic issue to achieve financial sustainability, and then we will look into to contractual arrangements, which may offer different type of incentives for the public-private partnerships.

2.2 Pricing regulations and tariff

Pricing regulation and tariff design is the most important issue to raise the financial sustainability of water supply and wastewater treatment. First of all we will discuss about the pricing regulations. For the private goods, market demand studies are good to draw demand and supply curve and arrive at a price or break-even point for production costs versus demand price. However, for the public goods like water supply and wastewater charges, the market studies are difficult to be done due to monopolistic nature of the goods. Non-market valuation techniques including stated preference (contingent valuation), revealed preference (averting behaviour method, hedonic prices), and cost-of-illness method is being commonly adopted to ascertain willingness to pay for the public goods. Some studies are based on mineral bottled water or the vendor charges. However, these prices are not realistic as either only a friction of the society is consuming bottled water or the people from poor communities, who use vendors, are using the services below their normal demand.

Contingent valuation is the best available practice for the developing countries to ascertain the demand and willingness to pay (Whittington 1998, Memon and Matsuoka 2001). The studies show that people are willing to pay more for standard utilities than what they are paying for sub-standard utilities at the moment (Altat et al. 1993). Hence, higher prices can be recovered, if the quality and quantity of the services could be improved. This objective is inline with the public-private partnerships, as they are supposed to improve the standard of the services. Hence, we can draw a new demand curve through a contingent valuation

study.

For the supply curve, usually long-term marginal cost is assumed as the best way to put the price on the service. For the practical purposes, it is difficult to estimate the optimal production quantity from marginal cost curve. Hence, we also need to calculate long-term average cost. The cross-section, where both costs are equal, is the optimal level of production. However, most of the water supply and wastewater services are bulky investments, as the demand for these services has to be calculated over certain years to incorporate population growth rates and improved living standards of the society. Hence, short-term, or facility specific cost curves are more appropriate. Furthermore, from the demand curve, based on a willingness to pay study, we can draw average revenue per each unit of production. Then, we can draw a break-even point, where normal profits can be made by the utility, is the inter-section for all the three curves viz.: marginal cost, average total cost, and average revenue.

Most of the studies support average incremental cost (AIC), as the optimum economic price for the services (Majumdar 1990). The total incremental costs include the investment costs and operating costs, as AIC can be calculated by dividing the discounting incremental costs by the corresponding discount volume of water/wastewater by the utility:

$$AIC = \frac{\sum \frac{I_t + R_t - R_0}{(1+i)^t}}{\sum \frac{Q_t - Q_0}{(1+i)^t}}$$

Where “ I_t ” is the investment cost (usually investment costs are considered as the initial costs incurring during first phase of installation; however, some replacement costs or additional installation costs may be required over the life of the utility). Recurrence costs or operation and maintenance are from year Zero to the end of project (in most of projects, operation and maintenance costs start with the start of production; however, some fixed recurring costs may start from the beginning of construction and installation phase). The incremental volume of water/wastewater is “ $Q_t - Q_0$ ” and the interest rate is “ i ”.

Under the perfect competition, the price will be independent of the output from a company; however, water supply and wastewater treatment services are monopolistic in nature and prices has been set by regulations and not influenced directly by the market mechanism. However, the pricing policies should incorporate the mechanism to deal the inflation and other uncertainties.

Tariff design: This is the most crucial aspect for the policy makers, as they have to optimally mix the financial and social aspects, as the society is a group of rich as well as poor households and these public services are meant for all. Due to this consideration, a cross-subsidy has been the most traditional way to adjust the tariffs. There are various ways to calculate for this adjustment depending on the targeted revenue, as shown by Majumdar (1990). However, it has been established that water is an economic and social good and it is not free (Black 1998). Moreover, Kolstad (1999) suggests that without a price system, polluter (consumer) do not “see” the damage caused by the pollution they emit and if polluter pays a price for every unit of pollution, this corrects market failure, at least in theory.

Although it is established that water is not a free good and every consumer of water supply and wastewater should have to pay, but still the question remains how much? The arguments made by Kolstad do not take care of socio-economic aspects of the consumers and everyone is being treated at the same scale. However, this is not a market good, rather a public good that should be reached to almost everyone in the community. Therefore, cross subsidies or indirect subsidies from other taxes should make this commodity affordable for all the people, at least up to minimum required levels. This has lead towards the concept of basic charges for a minimum level and then regressive taxes on the additional consumption. The other concept is of identifying the different classes of community either through income tax returns or through their housing and other living standards. Then charge them separately; however, this is a difficult to implement and there can be many loopholes for the charge evasion.

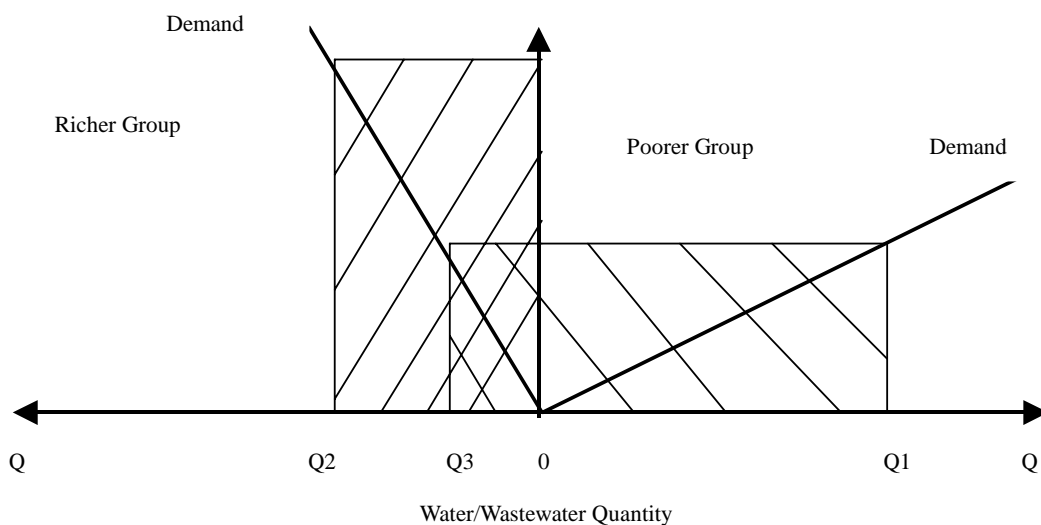
Regressive charges on the industries for water and wastewater services were also being seen unfair for the poor groups in the society, as Tietenberg (1996) observes that pollution tax may be regressive as higher prices hit poor people proportionately more, who spend all their money, then the rich people, who save some of their money. Therefore, subsidies are progressive to maintain vertical and horizontal equity.

The recent assessment shows that cross-subsidies have adverse economic, financial, and other effects, which often are not quantified or appreciated (Yepes 1999). First of all, the different set of prices to

generate the targeted revenue may send wrong signals to the different groups of consumers and may adjust their consumption accordingly. For example, in Fig 3, the poor group is being charged less generating losses, which should be cross subsidized from the profits to be generated through high prices on rich group. However, the poor group might find water/wastewater as a very cheap commodity, which could be exploited at the maximum, and they do not have any incentive to conserve water. On the other hand, rich group may also find this commodity as costly and may not use on the principles of economic efficiency. Therefore, the welfare of society also cannot be achieved at the optimal level.

The second problem is the difference between predicted and actual revenue. As shown in same Fig 1, the predicted revenue from both groups of the society may be in line with targeted revenue to achieve breakeven point. However, the people, who are paying higher prices, may either adjust their demand or try to find other cheaper sources. Hence, the actual revenue may fall short of the predicted revenue and may cause loss to the operator. Due to this problem, minimum throughput guarantees from the government are required by the private operators (we will discuss this in the next section).

Fig 2 Revenue under cross-subsidy



The third problem is the collection of the revenue. In the poor group, the revenue is so low that leaves little motivation for the collectors and sometimes overhead costs of issuing bills and collecting revenue exceeds the actual revenue being collected. This also gives a negative motivation for the collection of the revenue from that group of the society. On the other hand, the higher charges for the rich group may provide incentives for the corruption and in developing countries, this is the worst problem in most the tax collection departments.

This suggests that cross-subsidies often damage the economic and financial objectives rather to support social justice. Then how to proceed? The best option may be to estimate the demand with willingness to pay studies and then compare that demand curve with the supply curve of the utility. If there are losses, then the government can subsidize losses from the other sectors like income tax. However, if there is substantial difference between the rich and poor groups of the community, then the same willingness to pay studies can help to draw different demand curves and in poor areas, the base consumption level and price may be charged accordingly. This loss should not be cross-subsidize by increasing the prices in the rich areas beyond their willingness to pay rather these can be subsidized same way from the other sectors.

The other important aspect of tariff in this sector is concerned with the involvement of different agencies. For example, in Thailand separate ministries are responsible for water supply and wastewater treatment and water supply tariff is the responsibility of Ministry of Interior via Metropolitan or Provincial Water Authorities (MWA or PWA) while wastewater charges have to be collected by Ministry of Science, Technology, and Education, via the Pollution Control Authority (PCD) and Wastewater management Authority (WMA). The most suitable way is to make one organization responsible for tariff collection, as this will not only save overhead charges but it will also save confusion to many consumers who are not used to pay charges especially wastewater collection charges.

Tariff design for public-private partnerships cannot be left to them, as they are natural monopolies with judicial and political guarantees. Hence, government should carefully assess the tariffs and their impact on the affordability and the consumption levels of the community.

2.3 Contractual arrangements

Inviting private investment and/or management for water supply and wastewater treatment, there is a need of attractive contracts for the private sector. These attractive contracts should be comparable with the other opportunities available for the private sector. However, it is difficult to draw a direct comparison, as the nature of the investments is quite different and in the public-private sector, many factors have not yet realized fully, as this is a very recent trend. The major differences are due to investment in infrastructure projects, which characterized by large and sunk investments with long payback periods. Due to this reason, the public sector with scarce resources cannot arrange the investments on their own and the private sector cannot invest in this risky business without any guarantees and attractive terms and conditions.

The risks for the private sector are multifold, as the recovery of tariffs is sometimes a political issue and there may not be enough judicial help to recover the charges or to terminate the services to the communities. The inflation rate is much higher than the pay rise in most of the developing countries; hence, the affordability of the consumers can change within a few years hampering the profits for the operators. The foreign currencies usually appreciate as much higher rate than the local inflation and the gap between the collected revenue in local currency and the borrowing in foreign currency.

These risks can be avoided by proper incentives from the governments including hedging for the foreign exchange risk, the minimum throughput guarantees for the sale and revenue, judicial and political protection, tax incentives, partnerships by providing land and other services, and banning labour unions' powerful role similar to public corporations. Here, the judicial and political protection is the most important factor in the developing countries, as the political stability is an overall guarantee for private sector investment and effective judicial laws and system provides security to the investment. Then, the minimum throughput guarantees in terms of units to be sold (water supply or wastewater treatment) and the revenue for that. Tax incentives or tax holidays can provide an incentive towards profit-loss accounts, and operator can get the higher net profits which may be comparable to other investment alternatives in the private sector. The provision of land and other services on priority and concession basis is also an incentive for the operator. Therefore, a combination of incentives, regulations, and political and judicial guarantees should be mixed together to make an attractive contract.

There are various contractual types, which can lead towards public-private partnerships. The selection of the best available option depends on the targeted outcome; for example, if there is operation and maintenance inefficiency to be improved, or running a public utility on the lease basis to improve the operating efficiency, or make investments and manage the utility under BOT/BOO or under Full-utility concessions. Please Table 1 for different types of contractual agreements. Under the management contract, there are different contractual types, as in some places only operation and maintenance is required from private sector with annual payments to the operator; however, the collection of tariffs would be the sole responsibility of the public agencies. In the other case, this may also be the part of the same or a separate private operator. Similarly, lease contract is made between a private operator and a public agency to take over a completed utility, which might need some improvements. Then the operator can operate the utility and pay share annual profits with the public sector agency.

Build-Own-Operate (BOO) or Build-Operate-Transfer (BOT) and Concession agreements require private operators to invest their money with commercial risks involved. However, all these contractual agreements may have different type of construction, material, and revenue risks and guarantees. Hence each contract may focus different set of government priorities for specific goals including attracting FDI, technology transfer, and capacity development, as operators will hand over the utilities after certain years under the agreement. The credit support is mainly provided by the third party, which is may be an international agency like IFC, as the risks are high in water supply and wastewater in comparison to private sector investments and also in comparison to other infrastructure projects like telecommunications, power supply, and transport. The final type of contractual agreement is asset sale, where the operator does not need to return back the utility to the government. This is so far being practiced in UK only and its implications for the developing countries are yet to be assessed.

Table 2 Contractual agreements under public-private partnerships

	Management contract	Lease contract	BOT concession	Full-utility concession	Asset sale
Ownership	Public	Public	Public	Public	Private
Investment	Public	Public	Private	Private	Private
Operation	Private	Private	Private	Private	Private
Tariff collection	Public/Private	Private	Private	Private	Private
Time horizon	25 years	10 years	10-20 years	20-30 years	In perpetuity
Customer	Government	Retail customer	Government	Retail customer	Retail customer
Cash flow profile	Fixed-fee for service	Subject to market risk	Contracted payments due after construction	Subject to market risk	Subject to market risk
Construction risk	None	None	High	Low	Very Low
Regulatory risk	None	Medium	Low	High	Very High
Case studies	Puerto Rico, Mexico City, Antalya Turkey	Gdansk, Poland, Czech	Malaysia, Sydney, Izmit, Chihuahua	Argentina, Malaysia, Macao	England and Wales

Source: Adapted from Haarmeyer, D, Mody, A (1998), Tapping the Private Sector, RMC Discussion Paper 122, The World Bank, Washington, DC

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The management of the utility under the Public-private partnerships, which is normally cited as private operator, is not limited to only one investor, but it can be a joint venture of two or more groups, which may also include public agency as a partner. However, that joint venture will be registered as a separate entity as a commercial company and the government will not have the same political leverage as in the case of public corporation. Communities may also take over a utility on the own under any of these contractual arrangements. The community based water supply and wastewater management is getting popular in smaller communities including sub-urban areas or in the slums.

3. Presentation by the local governments

In this section we analyse the presentations by the local governments. We identify the major issues, which were presented and discussed. However, the original presentations are attached with this report at the end.

3.1 Understanding of PPP as a tool to overcome challenges for urban water

Public-private partnerships for urban water, is a concept that varies from region to region or it has different level of acceptance in different geopolitical conditions. Hence it would not be taken as granted that the widely perceived form of PPP by the international agencies would be implemented in all the cities

of Asia and the Pacific. We may categorize various levels of PPP as 'Advanced', 'Intermediate', and 'Basic' as under:

Advanced PPP: Macao and Manila have experienced an advanced level of PPP, where the joint ventures are involved in the retail water supply and wastewater services. At this level, the joint ventures are directly responsible make decisions on tariff, and after the approval from the government regulatory bodies, they have to collect the tariff. Therefore, the joint ventures have to improve efficiency and reliability to improve their customer base and the profits. This is a good incentive to achieve efficient services, if the government can play a role of good regulator to check the monopoly issues and also the investment plans in accordance with the contract documents. Weihai is studying the options to implement PPP for wastewater services; hence, it may also directly take advanced PPP, where retail wastewater services would also be a part of the PPP contract.

Intermediate PPP: Beijing is initiating PPP for bulk water services, which may be termed as intermediate PPP, as the joint venture is not involved in the retail business. Hence efficiency of the services may not be improved up to the required level. Moreover, the government has to pay directly for the bulk water supply on the agreed and adjusted tariff as per the contract. While, the government has to collect retail tariff from the customers, where the adjustments may not be politically viable in accordance with the adjustments for the bulk water tariff resulting into more subsidies and insolvency for the public sector. Nevertheless, in most of the countries, this is a good starting point to build the confidence of the community and the bureaucracy to enhance the role of the private sector for the provision of public goods like water supply and wastewater services. Bangkok, which is a mega-city like Beijing, has not yet implemented a PPP in urban water, but due to its geopolitical and socio-economic conditions, which are more or less similar to Manila, may opt for PPP in the near future.

Basic PPP: We are using this notion for the cities, where socio-economic or geopolitical situation is not feasible to introduce the PPP with international or strong domestic private sector participation. This basic PPP may be considered as community based, where communities participate on self-help basis to improve the access to the public sector water supply and sanitation facilities. For example, in Yangon the industries joined together to construct the secondary pipeline network connecting them to the public water supply, as the government is responsible for the construction of the secondary pipeline but it failed to do so due to shortage of funds. In Kathmandu, the municipality has initiated domestic private sector participation at basic level for solid waste management, bus terminals and parking, and to build industrial area. Therefore, based on these experiences, Kathmandu may initiate similar experiences in urban water. Similarly, Colombo has been experiencing domestic private sector participation in some of the activities for solid waste management, which could lead towards PPP in urban water at basic level.

3.2 Driving factors for PPP

From the presentations it is clear that scarcity of the government investment is the major deriving factor to introduce PPP in urban water. Under the broad issue of lack of investment, various other driving factors could be located. Efficiency is one of these factors, which is responsible for the lack of the investment, as the cost of production increases due to low efficiency, and cost-recovery is also at the minimum due to the losses as result of inefficient management, lower tariffs, and lower motivation to collect these tariffs. Hence, more investment is required to provide same level of the service, which could be provided at much lower investment but within an efficient system. The second important aspect is the increasing population of the big cities. More public utilities are required to cope with this population influx and population growth rates. Hence, per capita investment rates decline over time, if the investment is constant or being deteriorated due to government budget deficits. This is evident from the presentations made by Beijing, Bangkok, Manila, Macau, and Weihai.

3.3 Resistant factors for PPP

The major resistant factors include the political will, non-availability of strong private sector having technical as well as financial capacity to participate in urban water, and low affordability of the major portion of the population. This is evident from the presentations made by Yangon, Kathmandu, and Colombo. The cities, where PPP is not in business, are with either weaker governments or the governments do not have much liberty for the decision-making. Hence, decentralization is the major issue for the city governments. The representatives in the local assembly, who get the votes on the promise of no rise in the tariffs for the public utilities, further hamper the political will of the local governments. The mayor of

Bangkok has been trying to increase the charges, but so far he could not convince the members. On the other hand, the cities like Kathmandu and Yangon are having a bigger group of the communities with very low per capita income. Therefore, the affordability is the major reason for them to pay up to the level, where services become financially viable for PPP.

3.4 General consensus

All the local government representatives and the experts agreed that for most of the developing countries, PPP may be the best available option to increase the coverage of water and sanitation and to meet the coverage targets, as proposed by the national governments. Furthermore, most of the poor population is paying more in real terms, as they pay to private vendors a much higher price, and the people who suffer from water-related diseases has to pay for the medical costs besides suffering from pain and losing the productive labour.

The participants also agreed that effective regulatory role for the governments may prevent the negative effects of the PPP, which are mainly monopoly leading towards higher prices, black box syndrome resulting into non-attainment of technology transfer goals, and litigations leading towards inconclusive implementation of the projects. The governments can share and learn from each other to optimise their learning and implementation curve for PPP based urban water projects.

4. International experiences in PPP for urban water

This section discusses PPP in various countries, some at length and some briefly. Main data is based on Asian Development Bank (2000), Nickson¹ (2001), and Nickson² (2001).

4.2 Metropolitan Waterworks and Sewerage System (MWSS) in Manila, Philippines

Background: MWSS was formed in 1878 and serves an area nearly three times of the size of Metro Manila including 6 cities and 31 municipalities of Metro Manila plus Rizal and parts of Cavite province. The statistics for 1995 is shown in the Box 1.

Box 1 Salient features of MWSS project

Service area	1800 sq. km (with total pipeline of 12000 km)
Water production	3000 million liters per day from 3 treatment plants
Water connections	825000 with water availability for 16 hours a day
Service population	7.32 million out of 11.0 million (66.5% coverage)
Water consumption	133 liters per person per day
Average water tariff	Pesos 8.78 per cubic meter with 42.87% billing
Non-Revenue water	56% as in 1996

The supply of raw water depends on watersheds and aquifers, and rapid growth in population with raised living standards has strained available water resources, which were coupled with El Nino Effect (water shortages) created severe situation for MWSS to keep up with its targets.

MWSS was facing challenges in low coverage and lower level of services, higher unaccounted-for-water levels (losses), poor management, lack of investment, and inadequate tariff and allocation policies. Following the earlier developments for private sector participation (PSP) in infrastructure development, the government reformed the legal structures and incentive systems for the water sector. Two key enactments were:

- The BOT Law (1993), which enables PSP in public works activities.
- The Water Crises Act (1995), in response to the recurring crises in water supply. This legislation particularly was provided for the privatisation of the MWSS and the Local Water Utilities Administration (LWUA).

The study taken by Tasman Asia Pacific for the World Bank and the Ministry of Finance introduced PSP as a preferred method of addressing inefficiencies plaguing the water supply sector. Based on this study, the National Economic and Development Authority adopted Board Resolution 4 in 1995, encouraging:

- The introduction of commercial incentives and management in local water districts.
- Incentives for the Local Government Units to improve water supply arrangements.
- The application of economic pricing of water.
- Economic allocation principles for water resources.
- Innovation water supply projects at the local level.

- Increased PSP.

During the same year, the government decided to conduct a feasibility study into the form, extent, process, and guidelines for privatisation including formulation of the basis of offer and information for prospective bidders. The first phase, which took eight months, was devoted to forming a clear privatisation plan. The basis for the tender was to be water tariffs, and bids would entail many contractual obligations regarding coverage, water quality, and investments. The second phase in this process was implementation of the privatisation process.

The French government provided US\$1million for a technical assistance grant for the study leading to the privatisation process. The International Finance Corporation (IFC) was the lead adviser to select between two options of concessions and sale of assets. The eventual transaction cost of the privatisation program was US\$5.8 million. US\$3.8 million for adviser/consultant fees plus a US\$ million success fee (which MWSS advanced and was reimbursed by the winning bidders). This contingent or success fee was to be paid by the winners to the IFC on successful completion of the privatisation. The financial arrangement meant that the MWSS did not have to provide any funds from its own budget. The presence of the (private sector style) success fee in this case, and the absence of such incentives in most World Bank and ADB reform technical assistance is a possible reason for the relatively rapid and successful result in Manila. Outcome driven payments, rather than payment by inputs or reports, have the effect of focusing all parties on the defined goals.

Privatisation Process: The study recommended full privatisation of water supply services on the concession model. The total service area was divided into two zones (East and West) and the MWSS would retain ownership of the fixed assets and would transfer operation and management facilities to the concessionaires. Those would be responsible for future investments for water source development, treatment, distribution, and provision of sewerage facilities. The study drafted 25-year concession agreement for a Joint Venture (JV) and both JVs (East with 4.5 million populations and 71% coverage, and West with 6.3 million populations and 63% coverage) would have rights to Angat water (raw water source). The following targets were set out:

Universal water services for the population of the MWSS service area within 10 years without increase in real water tariff and for 24 hours service that meets WHO standards.

- Non-revenue water to decrease from 56% to 32% in the first 10 years.
- The one third of service area for the poorest, who are unable to afford piped water.
- Wastewater program to attain over 80% coverage within 25-year concession period.
- Approximately US\$7.5 billion to be invested to improve and expand water and wastewater system during the 25-year concession period.

Box 2 Coverage targets for MWSS project

Water Supply	67%	92%	97%	98%	98%
98%					
Gravity (sanitation)	7%	7%	10%	17%	23%
33%					
Sewerage (sanitation)		26%	23%	21%	24%
22%					
Septic (sanitation)					
Total (sanitation)	7%	33%	33%	38%	55%

Each bidding consortium was required to be composed of the following:

- Filipino shareholding should be 60% minimum
- Only local sponsor owning at least 20% of the shares, no other Filipino entity should hold more than half the shareholding held by this local sponsor.
- Possibly up to 10% of shares to be held by MWSS employees transferred from MWSS.
- Foreign shareholding should be 40% maximum.
- Only one international Operator owning 20% of the shares of the consortium

The concessionaries had to be Filipino companies and the water utilities were to be managed and operated by Filipinos. The minimum 60% of local ownership was proposed to be broken down as 10% for employees, 20% to 30% for the main sponsor, and 20% for the other local investors. The foreign investor was proposed to take at least 20% share in the company.

The physical targets and tariffs would be set and monitored by a regulatory body to be established within MWSS and the concessionaries were to be selected through a transparent bidding process against tariff. The recommendations were made to protect MWSS employees from loss of tenure. Finally, consortia would have to bid for both of the two concessions but could only win one. The detailed document was circulated before bid having provisions on:

- Assets and liabilities: Long-term debts were to be retained by MWSS, but serviced by the concession fees paid to MWSS.
- Clarification of transitional arrangements for existing projects.
- Tariff adjustments: The concessionaires were not to adjust rates, except for inflation, during the first 10 years. Such adjustments were to be subject to review and approval of the government. Moreover, upstream water treatment plants were to be managed and financed by the concessionaries.
- There would be scope for extra-ordinary price adjustments (EPAs) in defined or force majeure situations (as happened in 1998, when the Peso depreciated and there was a 30% drop in bulk water supply attributed to the El Nino effect).
- Allocation of capital costs: 90% were assigned to the West concessions in an apparent attempt to equalize what were expected to be lower tariffs in the western area. This increased the foreign exchange risk element in West concession.

The main phase of privatisation included pre marketing, registration, due diligence, strategy report, information memorandum, documentation, pre-qualification, tendering, pre-negotiation, bidding, evaluation, and award of contracts. The planned schedule was to start in April/May 1996 and to be completed by February 1997. However, the actual completion was in April 1997.

The bidding process was based on two-envelope system containing technical and financial proposals. The technical proposal was opened immediately and financial proposals were opened after 15 days. The bids were accompanied with performance bonds of US\$120 million for West zone and US\$80 million for East zone. The bids were made against the existing tariff of Pesos 8.78 per cubic meter and the lowest bids were made by Ayala Corporation at P2.32 (26.38%) for East zone and 2.51 (2863%) for West zone. However, one bidder had to be awarded only one concession and as per a pre-defined formula, Benpres Holdings won the West zone.

The Benpres Holdings/Lyonnaise des Eaux consortium was named Maynilad Water Services Inc. (MWSI). The Ayala/Bechtel consortium was named the Manila Water Company (MWC). The definition of boundaries and completion of the interconnection agreement is unresolved, and the tariff adjustments disputed as MWSI sought an increase of 15% in terms of P4.96 to P5.71 per cubic meter and MWC sought an increase of 97% in terms of P3.65 to P7.21 per cubic meter. This was coupled with devaluation of Peso in 1998 and drop of bulk water supply due to El Nino effect.

Lessons: There are few good lessons, which can be followed to improve the future projects:

- The privatisation process was highly successful and within time.
- The formula for bids was resulted in extra costs due to 50% devaluation. Hence, re-basing (reset the rate levels on fixed dates every five years) is a good way to renegotiate tariff.
- Interconnection agreement was not resolved and is subjected to arbitration.
- Appropriate bidding criteria for concession fees (highest fee for each concession would win) by pre-determining tariff structure may be good option.
- Bulk water rights and trading were not present in Manila; hence, it seems correct to proceed than apace than wait on the resolution of long-term and complex issues.
- Regulatory body must be in place, as the body was not properly in place; however, on the efficiency of both concessionaries and the trimmed MWSS was commendable.
- Secure high level advice and good public relations, as IFC performed well and well qualified companies provided the bids
- Low tariffs do not help in conservation targets; hence the tax incentives might not be provided to the concessionaries to get the lower tariffs.

4.3 Macau Water Supply Concession (MWSC), Macau, China

Background: Macau, China has a total area of just under 21 km and its population was 425000 in 1995, which experienced per capita income of US\$16184 in 1994. It retains its own political and legal system (based on western system separation of executive, legislation, and judicial powers) under the Special Administrative Region of the People's Republic of China. Waste supply was experiencing private sector participation since 1905, and it was owned and managed by Mr. Ho In. from 1936 to 1982, which was a minor part of his commercial and industrial activities. However, this system was deteriorated to the extent

that:

- Water quality was extremely poor with high salinity and turbidity. This was due to the poor quality of the raw water drawn from the eastern tributary of the Pearl River, a treatment plant working at overload capacity and a lack of scientific management and technology.
- Some areas were only receiving water at night due to lack of water supply capacity and pressure.
- Unaccounted-for-water was at high levels and the water utility was operating at a loss.

Concession award: New World, a Hong Kong (China) based development company took over the operations of Macau Water Supply Company, commonly known as Societal de Abastecimento de Aguas de Macau (SAAM) in 1982. The government put the condition that tariffs could not be increased. New World increased the income by replacing meters and by improving utility's management and financial systems. The unaccounted-for-water reduced from 40.3% in 1982 to 24.5% in 1984. In that year, the government and New World invited Lyonnaise des Eaux to help them improve water quality. Based on the negotiations, the concession contract, which was not put to commercial tender, was signed in 1985 and runs for 25 years till 2010. SAAM was restructured and 85% is now jointly owned by the JV company Sino-French Holdings Ltd., comprising Lyonnaise des Eaux and New World. Remaining 15% for the shares are held by shareholders in the old water company. The operation of SAAM is responsibility of Sino-French JV. The 25-year concession contract, a formal legal relationship between the government and SAAM, includes:

- Annual payments to governments of rental fee and sales tax based on the gross sales value of water supplied.
- Water supply quality to be improved to meet European Union Standards.
- Water Supply quantity must meet specified levels.
- Uniform water tariffs based on volumes consumed (government receives a small discount and water used for fire fighting is supplied free of charge).
- A tariff revision formula based on operating costs.
- Detailed regulations governing the utility's relations with customers, where provision is made for water supply to be disconnected for non-payment of water bills 45 days in arrears, in this instance a reconnection fee applies.
- Government delegate to act as a regulator of SAAM.
- Submission to government delegate of annual and five year forward investment plans for approval.
- Dispute resolution procedures.
- Specified ratio of shareholders funds to net fixed assets.
- Partial compensation for rehabilitation of existing SAAM assets, implemented in early years through the tariff revision formula.
- Macau (China) general company taxation laws apply to the utility's profits.
- SAAM is prohibited from investing in other countries including PRC.
- A government right of early redemption of the concession contract subject to two years notice after the expiration of the first half of the concession's term.
- Provision for extension of the concession contract by mutual agreement.
- Transitional arrangements for asset transfer at the end of the concession.

Privatization process: Under the concession contract an invest plan was submitted to the government and based on that SAAM invests approximately 40 to 50 million Patacas per annum in expanding and improving the water supply. These investments have been mainly arranged by the loans from domestic financial markets. This contract also includes the development of a new raw water source and the most appropriate source was the Modaomen estuary of the West River situated in PRC. However, due to geographical restrictions for business under the contract, the company needed to develop a relationship with a third party to supply it with this new source of raw water. Thus, the Water Supply to Macau Company (WSMC) was formed, which is hundred percent owned by PRO, supplies water to Macau and nearby Zhuai in China. SAAM has built a close relationship with WSMC by providing loans and technical and managerial expertise. The contractual agreement between these two companies specify that raw water tariffs can only increase in line with retail water tariffs. In addition to that deal, SAAM has undertaken following on-going investments:

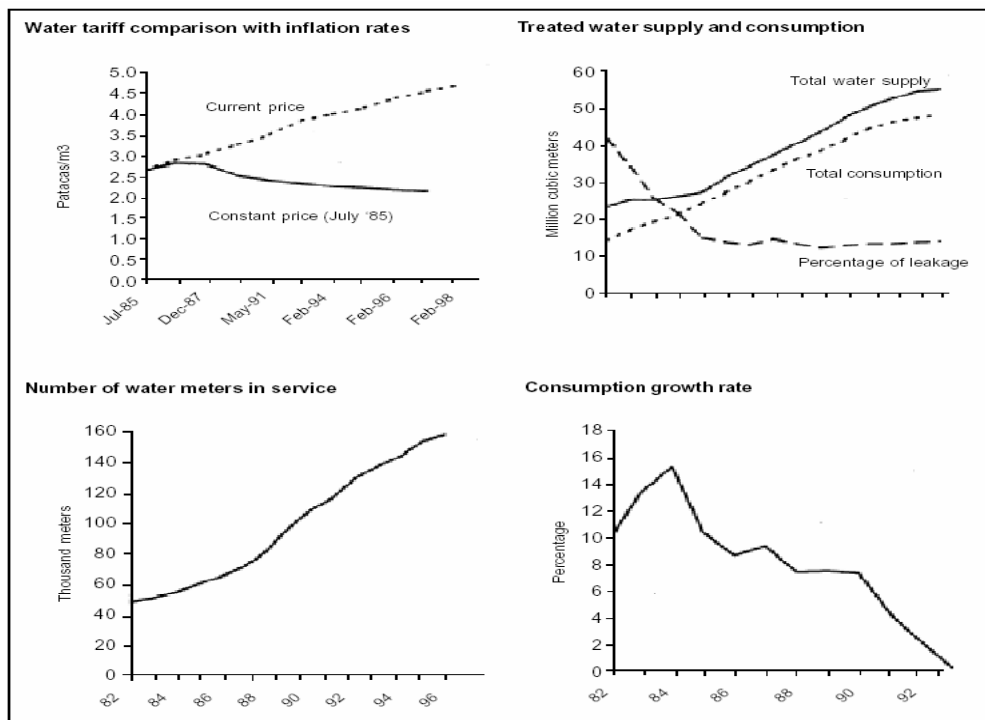
- Upgrading and extending water treatment plants
- Replacement of major pipelines.
- Reservoir construction and post-chlorination stations.

- Leakage detection activities and related investments.
- Introduction of computerized Supervisory Control and Data Acquisition (SCADA) system.
- Introduction of an automated water production control system.
- On-going upgrading or replacement of meters.
- Construction of new head office.
- A fully-fledged purpose-built laboratory.

Tariff regulations: In Macau, China, the water tariffs remained same for many years and did not fully reflect the cost of water supply. Thereafter, the government agreed to raise the tariffs from 1980 to 1985 twice from P1.80/m³ to P2.30/m³ in 1983 and then to P2.5/m³ in 1985. The concession contract stipulates that the tariffs should be set at a uniform rate for all customers. However, to regulate monopoly prices and profits, a number of approaches can be adapted including rate of return regulation, cost-plus regulation, and Price Index minus X regulation. However, this contract does not stipulate a minimum rate of return but uses a form of cost-plus tariff regulation. The annual revision of the tariff is based on the costs of raw water, energy, labour, and specified repairs and maintenance costs. This annual revision has not resulted into the full increase in the tariff as per formula mainly due to economies of scale due to increasing demand in line with the population and economic activity growths. Therefore, SAAM has implemented a lower tariff increase than what they could have been entitled as per the formula. This has brought a reasonable profit and as well as the good relations with the government and the consumers.

Outcomes: This has been a win-win situation for all the actors viz. the government, the concessionaire, and the citizens. The water quality was brought up to EU standard within 3 years of signing of the contract. Now everyone receives good quality drinking water at consistent pressure for 24 hours a day. The water demand and has been trebled between 1982 and 1998; however, the treatment capacity exceeds maximum daily demand by 20%. Unaccounted-for-water from leakages has declined from 40.3% in 1982 to 20.2% in 1985 (when the concession commenced). Now the leakages are between 13.8% and 11%, which, concessionaire believes, are mainly due to leaks within customer boundaries. In May 1998, SAAM had 250 staff including 2 expatriates. The productivity has increased and the annual turnover has increased by 68% in real terms; however, net profit has decreased from 21% against the turnover in 1986 to 14% in 1996. Therefore, reducing operating costs is a major issue. Some of the outcomes are graphically shown in Fig 2

Fig 2 Overall impact of PPP for MWSC project



Source: Asian Development Bank (2000), Developing Best Practices For Promoting Private Sector Investment in Infrastructure, Manila

Lessons: There are few good lessons, which can be followed to improve the future projects:

- The privatisation does not in itself ensure success unless there is a successful combination of competent and qualified concessionaire, capital, local knowledge, appropriate technology and expertise, and the regulatory framework including regulations on the tariff.
- The flexibility in the application of the concession contract has been critical to this success, some of the predictions, for example in demand and in FOREX, may be difficult to be made.
- A cost-based formula may not take into account the potential for cost savings due to economies of scale. Moreover, a uniform tariff structure for all the customers may not be a viable or efficient option for resource allocation.
- A positive two-way interaction between water supply improvements and economic growth.
- The existence of high quality and abundant source of raw water helped towards success. Therefore, increased economic activity upstream (PRC) can put resource in jeopardy and this risk needs to be managed through one authority through economic instruments.

4.3 Johor Water Company (JWC), Johor Bahru, Malaysia

Background: Malaysia is a federation of states, where water supply is within the jurisdiction of state governments; however, constitutional responsibility for sewerage rests with the federal government. Johor Bahru is the southern city in the state of Johor, where the Johor Water Company (JWC) is responsible for water supply. This utility was corporatised under the Companies Act in February 1994 and the state government holds 100% of the company's equity. This has been managed by a board made up of state government officers having full autonomy except for three decisions viz. the water supply contract with Singapore, the Malacca water supply contract, and two bulk water supply contracts which supply the JWC with its treated water. JWC implements these contracts but cannot deviate without reference to the federal government. JWC as a corporatised company can borrow from non-governmental sources and the corporatisation arrangements; it could not trench the staff for the first five years till 1999.

Moreover, under the utility's corporatisation, legislation a regular reviews proposed tariff increases etc. The current tariffs were introduced in 1991 for whole of Johor state, although costs, supply constraints, and demand differ between regions. The these tariffs are shown in Box 3

Box 3 Tariff structure under JWC project

Residential	Government	Commercial/Industrial
Shipping		
0-15m ³ @ 0.3RM/m ³ 3.7RM/m ³	1.15RM/m ³	0-20m ³ @ 1.2RM/m ³
16-30m ³ @ 0.7RM/m ³	Minimum charge 20m @ 1.6RM/m ³ 5RM/month	
31-45m ³ @ 0.95 RM/m ³ 45m ³ @ 1.15RM/m ³		minimum charge 10RM/month
Minimum charge 3RM/month		

Johor Bahru's average monthly consumption by residential customers is 32.3m³ and in 1995, the average monthly bill for a family was RM18.65 or US\$7.39 in comparison with the average electricity bill of RM39.30 or US\$15.57. The annual per capita GDP for whole of Malaysia was RM10,570 making annual water bill of RM224 as the 2% of per capita GDP. The demand of water has started increasing multifold due to increasing population as well as economic growth. A study by JWC in 1991 highlighted that unless bulk water supplies were to be built, the water shortages would be imminent; however, the federal government did not provide funding to build the capacity. Therefore, the state and federal governments decide to seek PSP in the supply of bulk treated water for the city of Johor Bahru.

Privatization process: The legal system is based largely on the British Common law system. Foreign investment in property in Malaysia is subject to approval from the relevant state authority. Any commercial/industrial property purchases are normally contingent on the purchase being made through a Malaysian company. This company should comprise not less than 70% Malaysian citizenry, 30% of which is to be Bumiputra (indigenous Malay). Additional approval from state government is required for acquisition of a real property (non-industrial), as the state authority operates as separate entity within such transaction.

Tender documents for Johor Bahru bulk water supply project were issue in August 1991, and 3 bidders,

consortia made up of local and international companies, were pre-qualified. Bids were submitted by December 1991, and by the end of June 1992, a 20-year concession contract had been negotiated and signed between the State of Johor (supported by independent specialist advisers) and Equiventures. This JV company comprising of Kembangan Dinamik (a diversified Bhumiputra company supplying 49% of the equity), Pilecon Engineering Berhad (a Malaysian publicly listed engineering and construction company, and Lyonnaise des Eaux). Both later supplied the remaining 51% of the equity. The JV consortium has delegated responsibility for operation, rehabilitation, and management to Strategi Tegas, a company jointly owned by the joint ventures. This company employs 85 people including an expatriate general manager. The contract is aimed to guarantee sufficient supply of drinking water to Johor Bahru, through following actions under BOOT/ROT:

- Operation and maintenance of existing works (encompassing a catchments area, intake tower, treatment plant, pumping station, pipelines and reservoirs).
- Rehabilitation and modernization of existing works.
- Financing, design, construction and operation of new works
- Transfer of all assets to the state of Johor at contract expiry.
- Water supply quality to meet WHO standards.
- The supply of bulk water in $\pm 10\%$ of the demand curve, drawn by JWC consultant.
- Weekly monitoring by Johor state government for compliance with certain water quality parameters.
- Penalties are prescribed if water quality fails to meet specifications.
- Payments are made by the JWC for bulk water. These payments are in two parts: (i) a fixed monthly payment based on fixed cost of the concessionaire; and (ii) a bulk water supply variable rate which is based on a decreasing sliding scale.
- A tariff revision formula, where the variable component of the bulk water tariff is adjusted annually with adjustments based on inflation, costs of energy, chemicals and labor.
- The fixed monthly payment is adjusted annually in line with inflation with minimum increasing being 4%. The maximum tariff increased is to be less than 5% for the first five years, 6% until 2001, and 7% for the last ten years.
- An arbitration clause
- Penalties for late payment.
- Re-negotiation of contract provisions is permitted after 10 years.

Financial mechanism: Malaysia has a good financial market and this is reflected from the contract is totally in Malaysian Ringgit. The 10-year loan to cover first two stages of investments was arranged with the Public Bank Bhd within only 3 months of signing the contract. The Permata Merchant Bank Bhd became the underwriting bank and provided a bank guarantee facility. Box 4 presents the details of finances in US\$ equivalents for 1992

Box 4 Financial statistics of JWC project

Equity	US\$40 million	23%
Cash generated from operations	US\$49 million	28%
Ten year loan	US\$88 million	
49%		
Total financing	US\$177 million	
100%		
Loan Draw down period	December 1992 to December 1995	
Repayments schedule	June 1992 to December 2002	
Bank guarantee facility	US\$18 million	

However, the BOOT/ROT contract for this bulk water supply involves investments of RM750 million (US\$284 million) spread out in 3 stages as under:

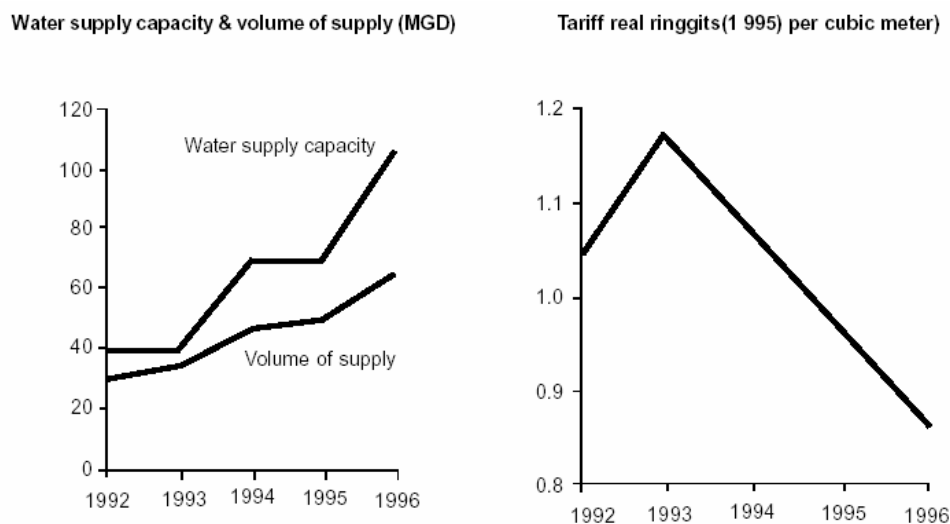
- Stage one works undertaken from mid 1992 to 1993:
 - An expansion of the existing 182000 m³/day Sundai Layang Plant with an additional 136000 m³/day treatment capacity.
 - Construction of a new intake/pumping station to transfer up to 17000m³/day raw water from Sundai Johor to the Upper Layang Reservoir.
 - Construction of a 25 km raw water pipelines between Sundai Johor and Upper Layang

- Reservoir.
 - Expansion of the storage capacity of the existing Upper Layang Reservoir by using Hyderoplus equipment on the spillway.
 - Modernization of the operational control system of the Sungai Layang production facilities.
- Stage two works were undertaken in 1994 to 1995:
 - Construction of phase one of a new treatment plant at Sungai Johor.
 - Construction of raw water and treated water pipelines for the Sungai Johor plant
 - Construction of two service reservoirs.
- The commencement of stage three of the project is triggered when Johor Bahru's water consumption reaches a level specified in the contract:
 - Construction of phase two of the Sungai Johor treatment plant.
 - Construction of associated pipelines.
 - Construction of Jengelli Dam; however, the construction may be rescheduled depending on certain circumstances.

Outcomes: The successful completion of has permitted a substantial increase in the quality and quantity of bulk water supplied to the city of Johor Bahru. The bulk water supply capacity had increased by 75% within 30 months of signing the contract. This capacity has supported well the growing population as well as economic activities. JWC has not increased tariffs since 1991, while the costs of supplying bulk water has increased in nominal terms. This means the disparity between retail tariff and bulk water tariff is increasing, which is being paid by JWC. This has depleted the profits for JWC and now it has awarded performance contract to a third party to reduce the leakages or unaccounted-for-water. The payments will only be made when non-revenue water is reduced to less than 20%. In 1995 this was 21% in comparison to 29% in the remainder of the state.

There is no demand management associated with shortages of water arising from the drought, as the capacity of bulk water was enough to meet the demand; however this will be a difficult task in future. Hence, there should be a link between the bulk water tariff and retail tariff. This can also improve the potential for a bulk water supplier to be involved in demand management at the retail consumer level. The need for management of Johor Bahru's water resources is more than just a retail supply as catchments and inter-catchments are the important issues. Currently no body in Malaysia is responsible for these issues.

Fig 3 Capacity and tariff for JWC



^a The contract was signed on 28 June 1992 and construction and restoration began in December 1992.
 Source: Lyonnaise (South East Asia) Sdn Bhd reported in Haarmeyer and Mody 1997.

Lessons: There are few good lessons, which can be followed to improve the future projects:

- Reliable bulk water supply system is essential to support the population growth and economic growth. Due to limited public funds, BOT/ROT may be a better approach.
- Bulk water supply contracts can be easily negotiated in comparison with retail or distribution

contracts, as the risks and more clearly defined and lower. Thus private sector can easily manage bulk water supply systems in comparison to retail networks.

- There should be a direct link between the tariffs for bulk water supply (to be paid to the concessionaire) and retail water supply (to be collected from consumers). Otherwise, there will be an insolvency problem for the utility. Therefore, the political decisions regarding lower retail tariff should be transparent and should be targeted for a short-term only.
- The privatisation of retail services can directly provide incentives for the concessionaire to take care of unaccounted-for-water by reducing leakages. Appropriate tariffs by the retail concessionaire also provide incentive to consumers to conserve water.
- Private sector can also handle demand management well to optimise the scarce resources.

4.4 The Cordoba Water Concession, Argentina

Background: Argentina is a federal nation with three levels of government (national, provincial, and municipal). The municipality of Cordoba, the capital of the Province of Cordoba, has of the largest areas of any major city in Latin America. Its area is 24 sq. km having second biggest population in the country at 1339164 (in 1999). Annual budget is US\$79 million with per capita expenditure of US\$59. Water supply in the city of Cordoba is a provincial responsibility, while sanitation is the responsibility of the municipality. According to the 1923 Constitution, water supply throughout Argentina was municipal service but then this responsibility was transferred to a federal entity (OSN). In 1975, the federal government devolved responsibility for both water and sanitation from OSN to the provincial level. In Cordoba province, this was managed by a new entity (EPOS). However, in 1990 the provincial government transferred responsibility for sanitation to the Municipality of Cordoba, while retaining the responsibility of water supply. On April 21, 1997, due to lack of public investment, the provincial government signed a concession contract with Aguas Gordobesas for water supply for the city of Cordoba. The municipality took no part in the negotiations, although the area for the water concessions was confined exclusively to the jurisdiction of the municipality.

Privatization process: In 1989, the public sector borrowed reached 12% of GDP and this was coupled with severe financial crises and hyperinflation in December 1989. The government of President Carlos Menem initiated a major structural adjustment program designed to radically reduce the public sector borrowing requirement through economic liberalization (tariff and non-tariff reduction), financial and economic deregulation (transport, ports, and postal service), a currency convertibility for establishing parity between Argentine Peso and US Dollar, and reform of the state, involving wholesale privatisation of state companies. The privatisation process had two important stages. During first stage (1989-91), telecommunications and civil aviation were key sectors that were privatised. However, the state negotiated badly, failing to ensure competition, contract compliance, and establishment of an adequate regulatory mechanism prior to sell-off. During the second stage (from 1992 onwards) gas, electricity, and water sectors were privatised. However, there was a marked improvement in the negotiating capacity of the State and the regulatory frameworks were established prior to sell-off. The privatisation was also moved to provincial and municipal governments, as Cordoba municipality prepared a strategy document for PSP in basic service provision. However, the provincial government did not devolve the water supply to municipality, mainly due to financial considerations, as the concession contract could provide a substantial revenue increase in the form of royalties amounting to US\$13 million in 1999.

Regulatory framework: Initially, the regulatory bodies were established after the key privatisation decisions were taken. Therefore, there were major complaints for high price rises and poor service quality. The Province of Tucuman awarded a 30-year concession contract to Vivendi in 1995, where the company doubled the tariffs, just after the few months of operations, without improving the quality and water became “inexplicably” brown. This led to a public protest, as 80% of residents stopped paying their bills. The new governor started a campaign leading to cancellation of the contract in 1998 and resumption of water operations by the provincial government. Vivendi then filed a US\$100 million suit against government. However, in year 2000, the government sought to encourage greater competition among privatised utilities by clamping down on what are seen as abuses of privilege by private companies that have benefited from monopoly conditions under weak regulations. This tightened stance was reflected in the province of Cordobesas, as it created new Secretariat for Control and Management of Contracts, and water and sanitation is responsibility of the Water and Sanitation Department. Another novel multi-sector regulatory agency (ERSEP) was created to regulate a diverse range of privatised public services including Aguas Cordoba. This agency will be financed through a 1.5% levy on the tariffs of the privatised utilities

as well as any fines that it imposes. This has made this agency controversial, as Buenos Aires's ETOSS is financed through 0.67% levy on water bills. ERSEP contracts out the monitoring of water quality to a state-owned laboratory that examines 600 samples per month. ERSEP also monitors implementation of the investment program of concessionaire, Aguas Cordobesas. Therefore, it is unclear whether ERSEP will play a role of a regulator to balance the interest of consumers and of the private concessionaire or it will play a role of contract enforcement on behalf of the provincial government.

Concession contract: Under this 30-year concession contract, Aguas Cordobesas would manage operations of water supply and sanitation within 24 sq. km jurisdiction of Cordoba municipality. Aguas Cordobesas, owned by a consortium of Argentina and foreign companies, has a paid-up capital of US\$30 million with a French utility multinational Suez-Lyonnaise des Eaux as the largest shareholder and operator of the utility. The break-down of the shares is as: Suez Lyonnaise des Eaux (France, Belgium) with 37.45%; Aguas de Barcelona SA (Spain and 25% owned by Suez Lyonnaise des Eaux) with 15.39%; Inversora Central SA (Argentina) with 14.94%; Empresa Constructora Delta SA (Argentina) with 14.50%; Banco de Galicia y Buenos Aires SA (Argentina) with 11.11%; and Servicios del Centro SA (Argentina) with 6.67%. The concession contract includes the following actions:

- Operate and maintain the 2,766-km pipe network.
- Reach 97% water coverage by the end of the concession (Year 2026).
- Pay royalties to the provincial government both for water abstraction (US\$0.019/m³) and for water transportation (US\$0.077/m³).
- Reduce average tariff by 8.2% at the start of the concession.
- Carry out an investment program of US\$150 million in the first two years.

The total investment plan has been estimated at around US\$500 million in order to reach the coverage target. From 1997 to 1999, the concessionaire has carried out investments worth US\$84 million including a US\$40 million, 10-year loan with 3-year grace period, from European Investment Bank (EIB). The loan represented 47% of the first 5-year investment plan.

Tariffs: The current tariff structure is complex and inequitable, as both volume-based and property-based charges combines to determine the tariff. All the households pay the same basic charge, directly related with the size of their property, for a minimum volume as shown in Box 5.

Box 5 Tariff structure under Cordoba water concession project

Property Size	Monthly Minimum Consumption
Up to 50 m ²	15 m ³
From 50 m ² to 150 m ²	0.3 m ³ per m ²
From 150 m ² to 250 m ²	45 m ³ plus 0.25 m ³ per m ² above 150
From 250 m ² to 350 m ²	70 m ³ plus 0.20 m ³ per m ² above 250
From 350 m ² to 500 m ²	90 m ³ plus 0.15 m ³ per m ² above 350
Above 500 m ²	112 m ³ plus 0.10 m ³ per m ² above 500

This has negative impacts on the equity, as on the one hand the property-based basic charge is very regressive with regard to the size of the property, as larger the size (rich person) more volume is permissible and practically only few rich people pay progressive tariff rates incorporated in the step tariff. On the other hand, even the consumers of excess water pay only mildly progressive tariff as properties are not individually classified according their value, because high-value properties in lower band zones are benefited and low-value properties in high band zone are suffering from this arrangement.

Another issue is of metering, as the contract stated that metering would be gradually introduced and that new domestic connections would have meters installed. The concessionaire installed 5000 new meters during 1997-2000; however, in low-income communities no meters have been installed. The concessionaire was not charging to these low-income communities. Therefore, ERSEP was negotiating for the introduction of so called "social tariff" for these low-income communities as US\$5 per month. This would be a very cheap solution, as the communities were paying US\$30 per month for 6m³ to private vendors.

Other challenges: Some of the main challenges under this contract as under:

- The coverage target is 97%; however, there are serious problems including land titling in the poor

communities; however, the mayor has committed to grant land titles to the poor.

- At present municipality supplies water through tankers to these poor communities for which apparently no charge is being made. There is no coordination between the municipality and Aguas Cordobesas on this issue.
- There are vendors, which supply usually low quality water at higher costs. There is a generally agreed policy to gradually reduce the number of these vendors. However, the contract does not spell out the targets. ERSEP is actively involved in the negotiations and 11 out of 44 vendors had been transferred to Aguas Cordobesas.
- According to the contract, the responsibility of the concessionaire is only to construct primary pipeline in the extending network and the responsibility of secondary pipeline (defined as less than 160 mm in diameter) and residential connections are the responsibility of the municipality and/or the households. Many households in low-income communities believe that the concessionaire should construct the secondary pipeline. The coverage targets depend on the solution of this problem.
- Land use policies are not being properly implemented as powerful real estate companies have influence over the direction of the city growth. This increases the problems for the concessionaire to plan according to the land use plans.

Outcomes: Following are the major outcomes till end of 1999 of this concession contract

- The citizens and the provincial government perceive the overall performance of the concessionaire as satisfactory by. The coverage has increased from 1000000 to 1140000 inhabitants in the two years (1997-1999) with number of connections increased from 208526 to 223462 during the same time. Water production varies between 350000m³/day in winter to 440000m³/day in summer totalling 140 million m³ of distribution during 1999.
- Annual gross income was US\$65 million with a net profit of US\$5 million, representing a rise of 11% above 1998 profits. The concessionaire paid US\$9922000 for water abstraction and US\$3149668 for water transportation totalling US\$13071668 in royalty payment. The staff numbers fell from around 1300 before concession contract to 436 in 1999 making a ratio of 1.95 staff per 1000 connections.
- The concessionaire has provided three direct benefits to consumers including 8% price reduction in average tariffs, an end to water cut-offs, and improved water quality leading to a sharp drop in sales of bottled water. The indirect benefit is through annual royalty payments averaging US\$13 million to the provincial governments, which can undertake development projects for the community.

Lessons: There are few good lessons, which can be followed to improve the future projects:

- There is the question of policy towards supply cut-offs, as Aguas Cordobesas has not cut supply to customers who have defaulted on their water bills. The company has started legal proceedings to obtain debts totalling US\$2 million from 2500 customers (1.1% of total customers) who have refused to pay bills since the award of the contract. The non-payment of the bills is mainly not due to the question of affordability, but it is due to a long-standing and widespread practice of perceiving water as a free good.
- There is the question of sequencing of the investment program, as under the terms of the contract, Aguas Cordobesas must achieve 97% coverage by 2026. The total investment required to meet this target has been estimated between US\$400 million and US\$650 million. However, in contrast to Buenos Aires contract, Cordoba contract does not specify five yearly coverage targets without the framework of the total period of the overall concession. Therefore, there is the risk of “back-loading”, whereby the concessionaire postpones major investment until the end of the concession period. In this eventuality, the residents of low-incomes areas would be the main stakeholders to suffer from delays in construction to the network.
- The separation of water supply from sewerage will make it difficult to optimise resources including protection of bulk water supply and tariff collection from the same consumers.
- The exclusion of local government from the contract makes coordination a difficult task on various issues, as discussed above, where low-income communities suffer the worst.

4.5 Water and Sanitation Services in Cartagena, Colombia

Background: Colombia is unitary state with three levels of government viz. national, departmental, and municipal. There are 32 departments and 1080 municipalities with a recent decentralization after a dichotomous system was being practiced, for over a century, under 1886 Constitution. The reforms for the direct election of mayors, the introduction of local referendums, the fiscal strengthening of local government, administrative decentralization, and citizen participation in municipal affairs were incorporated in a new municipal code during 1986. Municipality of Cartagena, the largest municipality and capital of department Bolivar, also practices a strong tradition of political clientelism. Having an estimated population of 850000 and a budget of US\$177 million with per capita expenditure of US\$208 in year 2000, faces the investment constraints due to deteriorating economic situation and growing poverty in all over the country with most unequal income distribution at the Gini co-efficient of 0.57 (1996). This poverty and insufficient public sector investments led towards deterioration of basic utilities. As the responsibility for these basic services had been devolved back to the local governments and the financial decentralization was introduced to enable municipalities to support their basic services on their own. Moreover, as the national government's priority for water and sanitation became high since 1995 with a primary goal of 90% coverage for water supply and 77% with proper sanitation with a cost of US\$1400 million and also through improving quality of drinking water, reducing leakages, and inducing environmental conservation measures. This ambitious plan increased the need of PSP to support the investment and management activities.

Privatization process: The 1991 Constitution emphasizes the importance of efficient public services and a new legislation (Law 142), passed in 1994, laid down explicit criteria for efficiency in terms of planning, regulation, and supervision. The government introduced a market approach that assigns a key role to private capital and technology in the institutional reform process. This led to PSP in public service provision. Furthermore, Article 69 of law 142 of 1994 created separated regulatory bodies for water and sanitation, electricity and gas, and telecom. Hence a semi-autonomous regulatory body (CRA) for water and sanitation was set up under the Ministry of Economic Development to promote competition, encourage investment, and prevent abuse of monopoly power in order to ensure reasonable tariffs, high quality and ample coverage in service delivery. Moreover, Article 76 of the same law also created a public services watchdog (SSP) to monitor the day-to-day operation of the companies entrusted with the delivery of basic utilities though a close liaison with municipal authorities. Its key roles, for water and sanitation, are to ensure that the regulatory decisions of CRA are applied in particular with regard to cross subsidies, to hear and decide on complaints from customers, and to examine corporate financial management. The SSP is empowered to fine water companies for violation of agreed norms.

However, the major emphasis was to create joint ventures of private and public sectors to achieve twin policy objectives of strengthening local government and encouraging PSP. The economic argument for JV is that the municipality should retain ownership of the assets, as under the more conventional concession contract. Due to a major shareholder in the JV, municipality has a financial motivation to promote efficiency of the utility. On the other hand, the political argument emphasizes that being a major shareholder in JV, the municipality is well positioned to monitor and control activities of private sector partner. However, this is in contrast with traditional concession model, where the public sector effectively handed over control to the concessionaire for day-to-day operations. Nevertheless, the criticism from labor unions for "sold out" to private sector was muted through these joint venture arrangements between public sector and private sector.

PSP in Cartagena water and sanitation: This was the first city to experience the PSP in electricity and in airport. This was also the first city to introduce PPP for water and sanitation through JV company AGUACAR, which was formed between the municipality and a private sector company Aguas de Barcelona (AGBAR). The municipality holds 50% shares (300000 shares), Aguas de Barcelona holds 45.9% shares (275,478), and other private investors hold about 4% shares (24,522). A 26-year concession contract was signed to operate and maintain these services, and consequently AGUACAR signed a management contract with AGBAR. The immediate aim was to improve the financial position and the efficiency by attracting necessary private sector technical skills. However, the main agenda was to secure finance from international financial institutions for upgrading and expanding the deteriorating system. Therefore, under the 1995 contract with AGUACAR, the AGBAR was only responsible for the management of the system; however, the municipality awarded a separate contract in 1998 to manage a major investment program that is mainly financed by the World Bank and Inter-American Development Bank. This is a complex contract, where the private sector partner has to carry out the functions normally

found in a French style-concessionaire model, but with the protection from financial risks inherent in such an arrangement.

According to AGUACAR, coverage of water supply has increased considerably from 73% in 1995 to 90% in 1999, and sanitation coverage has increased from 55% to 75% during the same period. However, the World Bank suggests that still one-third of the poor communities are without running water and basic sanitation. This contrast is due to AGUACAR's boundaries for the municipality, and most of these poor communities are outside the legal urban boundaries (Box 6)

Box 6 Financial statistics for Cartagena concession project

(Figures in million Colombian Pesos)	1998	1999
Gross Income	61585	57642
Operational Profit	10010	
11511		
Net Profit (after tax)	4694	3927
Dividend	1800	2112
Inflations Rate	15.7%	9.6%
Unpaid bills	25624	
30692		

Tariff structure: The figures clearly show the good performance, but a growing problem of unpaid bills. This is linked with two major issues. One is the general perception for water as a free good and the other is tariff structure. Although the tariff structure is based on “pro-poor” philosophy aiming for efficiency and equity, but it discourages well-off consumers to pay, as they have to pay more than the economic costs to cross-subsidize for poor communities.

The tariffs are theoretically aimed to generate enough funds to cover operation and investment costs on the one hand, and there should be a provision for cross-subsidies in the form of “solidarity fund.” The municipality carries out survey to divide household in their jurisdiction into six levels depending on the nature of house construction. The 1994 legislation requires that owners of the houses at level 4 should pay the economic costs (to cover operation and capital costs) and the consumers below that level should pay subsidized amount, while the consumers above level 4 should pay more to cover these subsidies.

Outcomes: The overall situation is satisfactory from municipality as well as from consumer point of view. System efficiency has also improved remarkably since 1995 as measured by labor productivity, leakage rates, service reliability, water quality, and customer care. The targets for reducing financial burden of the municipality, and as well as the improvements in the technical skills through PSP has also been met so far. Moreover, the major target of getting support from international financial agencies to improve and expand the existing system has also been achieved. Nevertheless, all this has been achieved through JV, without transferring ownership to the private sector, to avoid any backlash from unions.

Lessons: There are few good lessons, which can be followed to improve the future projects:

- Cross-subsidies from rich communities to poor communities within tariff may lead towards tariff evasions and non-payment. Hence, cross-subsidies may be arranged from other taxes, for example income tax and property tax in a transparent manner to achieve the target of subsidies without failure in “efficiency” and “cost-recovery.”
- The targets for coverage should be stipulated clearly with short-term division of the overall target to avoid delays and backlog.
- The boundaries of the municipality, for the contract point of view, may not be enough to cover all the urban inhabitants, as many poor communities are living in the slums. Therefore, appropriate provisions should be made in the contract to cover all these communities.
- To avoid backlash and protests from politicians and labor unions, it may be a good strategy to follow Cartagena example; however, in the long run this may run into troubles, as early signs were indicating from non-payments. Therefore, gradually this may be converted into normal concession contract with appropriate risks for the concessionaire and enough free hands, in terms of ownership and management, for the management to make these projects efficient and sustainable in the long run.

5. Prospects for public-private partnerships for urban water in Asia

PPP in urban water sector of Asia is comparatively less than the experiences in power sector with 39

concession projects amounting US\$27544 million, and in transportation sector with 38 concession projects amounting US\$34055 million (Kwak 2002). There are about 10 concession projects amounting US\$6617 million. This was mainly due to water being a different public good than power and transportation, as water is a basic need with historical perception of being a free gift from Nature. However, the current studies (Altaf et al. 1993, Memon and Matsuoka 2001) suggest that people are willing to pay for a reliable service, which can be introduced through PPP. This is also evident from the three Asian case studies, as discussed above.

The major driving force, in addition to general objectives regarding lack of public funding and operating inefficiencies, is the globalisation of the construction industry supported by strong international and some local financial markets. The share of local partners is superseding the foreign partners; however, this is mainly due to government policies to promote local industry and to bring international technology and investment up to the certain levels. The share of international investment also varies from sector to sector, as transportation has the highest local share due to local materials and labor, while power sector has the highest international investment share due to its high tech equipment and expertise. Water sector lies in between these extremes, as the bulk water supply projects tilt towards international investment due to technology requirements, while the distribution system is tilting more towards local investments due to low-tech and labor-intensive technology requirements.

Water sector can be benefited from the experiences in power and transportation sectors, where PPP has been introduced relatively earlier and having comparatively large number of the projects. Kwak (2002) shows that there are five major outcomes based on these experiences:

- The average value for 14 concession projects with major problems in Asian was approximately \$1,418 million. This value is almost twice the total mean value of the 87 sampled projects of US\$778 million. Here 28 projects were less than US\$200 million of the 87 projects; however, none of the small-sized concession projects were included in the list of the problematic projects.
- The concession projects in Australia and Hong Kong have a better record of success, due to the evolution of concession markets. In Australia, most concession projects have been developed by home-based contractors and funded by home-based banks to reduce legal complexity and FOREX rate risks. While in Hong Kong, international contractors, developers, and bankers have been promoted most of the concession projects due to availability of mature financial market with a confidence of international capital investors and lenders to make transactions in simpler, faster, and transparent manners in comparison with most of the other Asian countries.
- Philippines, Australia, and Hong Kong are the most successful experiences and English language is one of the common factors in this regard due to most of negotiations and documentations are being made in this language.
- The projects, having only a single concessionaire, have failed badly (11 out of 14 projects). The concession projects with JV are normally aimed to involve the parties, which can mitigate the risks effectively and a single company may not have expertise and capacity to do this.
- The risks, led towards problematic projects, can be categorized into nine areas viz.: political, social, economic, financial, legal, managerial, technical, environmental, and physical. However, it is comparatively easy to identify the major risks in an individual country/region depending on the socio-economic, geopolitical, and financial market characteristics.

6. Conclusions and recommendations

Public-private partnerships are the best available option, due to unavailability of public sector investment and due to operating inefficiencies in the public sector, to provide water supply and wastewater services through private sector investment, and managerial and technical skills. However, a careful design and implementation of the PPP projects could only guarantee to meet these objectives over a long-term. This includes setting the appropriate tariffs and the contract.

Water is a public good; however, the exclusion rights are different from power and transportation, due to water being also a “basic need.” Therefore, the tariffs should also meet the objectives of affordability and equity in addition to the objectives of cost recovery and incentives to conserve the water. However, there should be cross-subsidies, by charging someone more to pay for someone else. This should be coupled with the feasible coverage targets, which should be in detailed to cover short-term targets for leading towards the overall target. A proper master plan would be helpful to set and achieve the coverage targets. Thereafter, the proper incentives for the private sector should be incorporated keeping in view the risks of such projects. The regulatory bodies should be essentially in place before hand and proper institutions should be established. The regulations on the various risks and the revision of tariffs and concessions should be provided within the contract. The risks should be allocated to the companies, which can mitigate

those risks well. Hence, a good combination of the companies in a JV is an important factor.

International experiences also suggest that strong domestic financial market is the most important ingredient for the success, which also helps to avoid FOREX rate devaluation impacts. The private companies should also be involved beyond the bulk water supply and treatment, as they can operate and manage the retail business efficiently, based on their experiences and the inter-link between the tariffs for bulk water and the customer tariff will reduce the burden of subsidies and insolvency for the public sector. Nevertheless, the latecomer advantage for the water sector will help speedy and successful implementation of PPP projects, if the actions would be taken to avoid the same problems, which resulted in the problematic projects in power and transport sector.

Recommendations: These are divided into two parts, the first part contains the general recommendations and the recommendations on the role of Kitakyushu Initiative and the second part contains the recommendations for Chinese cities.

- i. PPP may increase the coverage of environmental services like urban water and consequently improve the urban environment
- ii. The objectives of efficiency and equity along with dynamic economic impact on environmental industry may also be achieved, if PPP are planned and implemented very well
- iii. However, the government, with the help of stakeholders, should address various issues including the following beforehand:
 - a. Legislations, regulatory framework, and institutions
 - b. Public awareness for social acceptability of PPP
 - c. Information on all the aspects of PPP
 - d. Understanding of diversities in the cities
 - e. Long-term perspective for public interest
 - f. Resistance to monopoly and cartel formation
 - g. Clear understanding of goals and the road map
 - h. Black box syndrome for technology transfer

Role of Kitakyushu Initiative:

- I. Information: Collection of successful practices to provide information on the various aspects including targets and process of privatisation, legislations on PSP including on the share of local versus foreign companies, technology transfer, and tariffs and subsidies
- II. Networking: Cities, national governments, experts, donors, and other stakeholders may use this network as a common platform to interact and come up with better partnerships for speedy and efficient delivery of the urban environmental infrastructure
- III. Pilot activities: Implementation of pilot activities to provide a foundation for PPP based projects, as the first activity is being launched in Weihai (Wending municipality)
- IV. Expertise: To arrange expertise for the cities to assist them to arrive at the appropriate form of PPP. This includes individual assistance as well as joint assistance in the form of seminars, workshops, and training programs

Relevance with Chinese Cities:

- The primary need is to strengthen the legislation on PSP for urban environmental infrastructure including urban water. The legislations may be required to make an appropriate combination of local versus international share in the joint ventures for the sake of technology transfer and to strengthen local entrepreneurship
- The regulatory bodies should be intact prior to PPP initiative. The appropriate regulations should also be framed to address the critical issues including tariffs, subsidies, debt and equity ratio, local and foreign investment ratio, the financial inflow and outflow of the investment, and the holistic management concept
- As for as the common risks are concerned, political and legal risks could be dealt at the national level through legislations or commitments. Social,

economic, and environmental risks could be better dealt at local level and it might a good idea to categorize China within various geographical or socio-economic zones. The financial, technical, and managerial risks could be mitigated with the good combination of joint venture companies, so the risks can be allocated to those companies, which can mitigate those at the best

- China can capitalize on the strong international exposure in Hong Kong for investment, technical, and management companies. It can also encourage its strong domestic banking and construction companies to take a leading role in the PPP based initiatives

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