A Real Trickle-Down Effect: Improving the role of small-scale water providers in the Asia-Pacific

Simon Unwin

Institute for Sustainable Futures
University of Technology Sydney

Introduction

Aware that the world is not on track to meet the Millennium Development Goals' commitment to halve the number of people without access to safe drinking water and sanitation by 2015, the United Nations has declared 2008 the International Year of Sanitation (UN 2006). Accordingly, the Australian Agency for International Development (AusAID) has committed to a Water and Sanitation Initiative, involving increased water and sanitation funding in Asia and the Pacific in 2009-2011. The Institute for Sustainable Futures (ISF) and the International Water Centre are working to determine investment options and strategic direction for AusAID in this sector, focusing on partnerships with non-government organisations (NGOs). This literature review will help to contextualise the work of the ISF in this area and will hopefully serve as a useful resource for future research.

Many millions of people live in areas which are variously termed peri-urban areas, informal settlements or slums (McGranahan et al 2006, p5). State-run or state-owned water and sanitation infrastructure often provides limited coverage of these areas (McGranahan et al 2006, p1, 5-6, 45). Likewise, in cases where entire water and sanitation systems have been privatised on a large scale to encourage efficiency, these efforts have been controversial and it does not necessarily follow that services to the poor are improved (Budds & McGranahan 2003). McGranahan et al contend that "the large Northern multinationals that compete for [concession contracts]… typically have little experience or inclination to operate in the poorer settlements" due to perceptions that serving the poor is unprofitable (McGranahan et al 2006, p1; Budds & McGranahan 2003 p109).

However, residents of these areas not covered do get their water from somewhere and their waste is disposed of somehow (Solo 1999, p118). Many small-scale water providers (SSWPs) based in the same communities fill the gaps left by state-based infrastructure and the large scale private sector, and provide services to the poor. Often these small-

scale water providers are considered illegal and may not provide best quality service (McGranahan et al 2006 p2-3). Many are hampered by a lack of capital to invest in providing better water quality or extending piped supplies, and often customers of water kiosks are forced to carry water long distances every day.

Strengthening the capacity of these small-scale water enterprises has been raised by many researchers and practitioners in the development field as a positive, community-based and pro-poor way of improving access to better-quality water in peri-urban areas (McGranahan et al 2006) in the short to medium term. In this way it is hoped policy and international aid efforts to augment state-provided services in this sector can avoid some of the problems of accountability that can be caused by large-scale concession privatisations – for example in Manila, the Philippines, where the two large concessionaire companies have been able to change the terms of their contracts to their benefit, with little public input into the process (Finger and Allouche 2002, McIntosh 2003 p174-176).

Research into how best to develop the capacity of this sector (and how it has already been done) has mostly focused on Africa and South Asia (see the work of the Water, Engineering and Development Centre at Loughborough University, as well as Tova Maria Solo's work for the World Bank). The purpose of this project is to draw together existing studies and information about small water enterprises in three cities in South East Asia – Manila and Cebu (Philippines), and Ho Chi Minh City (Vietnam).

This literature review has been informed by desktop research, taking in content published in academic journals, by non-government organisations and multilateral organisations such as the Asian Development Bank. Existing research on small-scale providers is largely set in urban contexts and this is reflected in the paper; covering rural water supplies was thought to be outside the scope of this project. Likewise, there has been less readily available primary research into small-scale sanitation provision – not to mention that sanitation is its own large subject area – and so this paper does not deal with sanitation as was initially hoped.

The section on '**Small-scale Water Providers**' identifies characteristics of SSWPs and some of their relative strengths and weaknesses. The section on '**South East Asia**' explores the prevalence of SSWPs in South East Asia and the factors that account for this. **Case studies** were identified from the literature to root the paper in on-the-ground experiences of SSWPs and the contexts they exist within. Case study cities were Ho Chi Minh City (Viet Nam), Manila and Cebu (Philippines). Key questions for the selected case studies include:

- What is the range of existing small-scale operators and what are the roles that they play?
- What is the existing regulatory and institutional environment for small scale water and sanitation providers?
- What strategies can be implemented to increase the effectiveness of these providers (capacity development for this sector, formalisation of its role, etc)?

The **conclusion** will collate suggested strategies for the supporting a greater role for SSWPs and suggest further directions for research.

Small-scale Water Providers

Solo (1999) points out that "everybody alive somehow obtains drinking water and disposes of waste waters. In most of the cities of Africa, Asia and Latin America, where less than half of the population is actually served by the utility networks, someone else provides the basic services" (p118). These providers are known variously as small-scale water providers (SSWPs), small water enterprises, informal providers or independent providers.

Solo (1999) indicates studies carried out in Ethiopia, Guatemala, Paraguay, Mali, Mauritania, Haiti, Yemen and Senegal by Hydro-Conseil under the French NGO programme *Solidaritie Eau* which "suggest that the unofficial entrepreneurs in water and sanitation run a wide gamut from monopolistic price gougers to community volunteers on the verge of bankruptcy" (p120). So what do they have in common? Hervé Conan (2004) provides the following characteristics as a starting point:

- **Small in scale.** The provider's infrastructure or installation is not city-wide and covers only a single neighborhood or a part of it. The business has a staff of less than 100 and is, more often than not, owner-managed.
- **Independent.** The provider does not receive any public subsidies or support from NGOs.
- **Private.** Capital investment comes from private sources. Providing water is the main livelihood of the people behind the venture. The business is not driven by external investors. (p9).

SSWPs can take a number of different forms. Broad categories identified by the literature include:

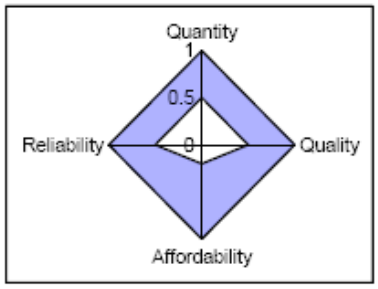
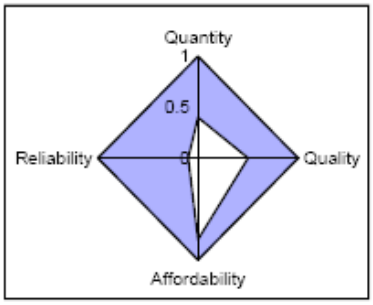
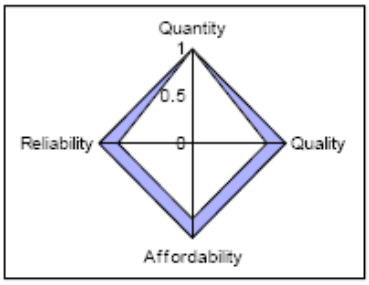
- **Distributing vendors** – these use containers, handcarts, animal-drawn carts, bicycles or trucks to transport water to customers from the source, which may be

a utility water connection or a private well or pump. Tanker trucks are able to carry bulk supplies of water and require more capital investment, so prices for truck-delivered water are higher and often serve higher-income customers. Vendors that use carts etc. expend long hours of labour and make little profit. They are usually from low-income households similar to the ones they serve (McGranahan et al 2006 p10; McIntosh 2003 p194-195; Conan 2004 p9). These vendors are often "the most accessible to the urban poor, often less than 100 metres away" in a city like Manila.

- **Kiosk vendors** – these have customers travel to them to collect and pay for water on a daily basis. This can range from selling to neighbours, to those located longer distances away. Kiosk vendors may source their water from a utility water connection or a private well or pump, and require a small investment to dig the well or connect to the utility (McGranahan et al 2006 p10; Conan 2004 p9).
- **Piped networks (aka 'pioneers')** – these invest significant amounts of money to build and operate small networks with individual connections to customers houses, or supplies delivered by hose. Water is usually purchased in bulk from the water utility, or sometimes pumped from a private well. Customers may be charged a fee to be connected to the network (McGranahan et al 2006 p10; McIntosh 2003 p194-195; Conan 2004 p9).

See Box 1 below.

Box 1 – **Demand-response characteristics of small-scale water provider types**

TYPE OF SERVICE	CRITERIA	RESPONSE
Pushcart		
	Quantity	Low volume per service (maximum = 200 liters)
	Quality	Depends on water source. Generally water quality deteriorates during transportation.
	Reliability and Convenience	Service is provided at home, generally on request.
	Affordability	Retail water is generally expensive, but actual amounts paid are low due to low quantity served at each time.
Standpipe		
	Quantity	People who fetch water from a point source or standpipe consume less water than those with a house connection (20–30 l/p/d compared to 50 l/p/d)
	Quality	Water from tap is usually safe. Contamination occurs during transport to house.
	Reliability and Convenience	Point source can be located at some distance from home. Standpipes are not open all the time (8–12 hours/day) and users may have to queue. Area around tap is often muddy.
	Affordability	Though cost of having a standpipe attendant inflates the volumetric cost of water, amounts paid remain low due to low volumes.
House Connection		
	Quantity	Users consume as much water as they want if service is reliable.
	Quality	Quality will depend on the source and effectiveness of treatment.
	Reliability/ Convenience	Service design ranges from 24 hours continuous to intermittent (but regular, depending on reliability of electricity supply).
	Affordability	Connection fees range from $15 to $100. Tariffs are generally lower for people connected to a piped system than for those not connected.

Note: Representations in this Figure were prepared by the study team.

Taken from Conan, H. (edited by Andrews, C.T. and Weitz, A.) 2004, *Small Piped Water Networks: helping local entrepreneurs to invest*, 'Water for All' series, Asian Development Bank, Philippines.

During the 1990s, neoliberal arguments regarding water provision – that private ownership of water distribution would enhance efficiency and levels of investment – gained prominence, resulting in numerous large-scale concession privatisations of struggling water utilities in the global South. Solo (1999) argues this meant that "the other private sector", that is, small scale providers, was undervalued and ignored; participants in this "other private sector" were even cast as "the bad guys" who exploited poor segments of the urban population (p118-120). However, this is not always the case; in fact, small scale water suppliers have often proven adept at providing water at reasonable prices to those not adequately served by utility infrastructure.
Generally the strengths of SSWPs identified include:

- SSWPs are **flexible** and **accessible** – SSWPs are often close to their community and therefore can be responsive to community's needs – for example, most city-wide water utilities bill customers on a quarterly or monthly basis, charging large lump sums that poor customers are unable to pay at once. SSWPs by contrast are more likely to bill customers on a daily basis, or have negotiable billing periods (McIntosh 2003, p195; McGranahan et al 2006, p9). SSWPs are less likely to charge high connection fees.

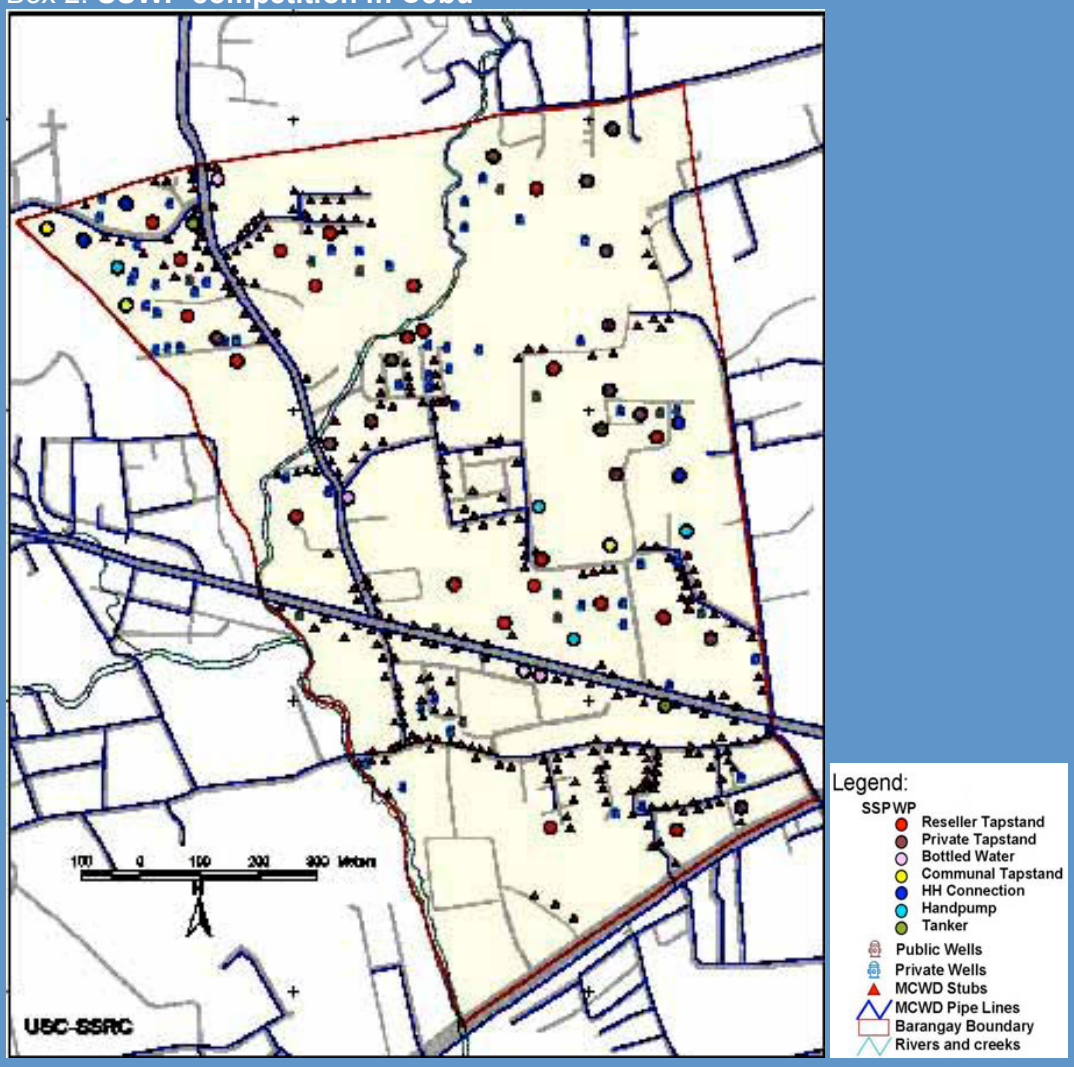
- SSWPs are **adaptable -** SSWPs can often go where utilities can't or won't. For example, high-altitude areas, areas subject to flooding, and illegal or informal settlements are some cases where the physical or social layout of 'peripheral areas' and the technical standards or business practices of the utility are often not suited to each other – SSWPs can step in to fill these niches (McGranahan et al 2006 p3).

- SSWPs are **local** – SSWPs provide a source of local employment, have good local knowledge and make use of local resources.

Solo in particular emphasises the significance of SSWPs as private, independent enterprises: "Although there is a tremendous variation in terms of price and quality of service offered… [SSWPs] recover their costs fully and are financially sustainable – or

out of business" (Solo 1999 p122). And, as there is not always a monopoly of supply, SSWPs are often forced to compete with each other for customers, with obvious benefits for consumers – costs driven down and extra services offered. In this sense SSWPs "have been found to conform far more closely to the free market ideal than do private utility operators" – see Box 1 below (McGranahan et al 2006 p2)

Box 2: **SSWP competition in Cebu**



This map shows the amount and different types of small scale water providers in Barangay Labangon, a neighbourhood of about 5 500 households in Metro Cebu, the Philippines. A utility pipeline runs through the barangay (community/village) from which most SSWPs source their water. Competition amongst SSWPs here is clearly healthy.

- 4 SSPWPs provide household connections servicing from 3–16 households each;
- 14 SSPWPs each serve 5–30 households through private taps;
- 21 resellers each serve 3–30 households through taps; and
- 4 communal standpipes each serve between 35–45 households.

Altogether SSWPs serve around 20% of the households in the barangay.

(Taken from Conan, H., 2004, *Small Piped Water Networks: helping local entrepreneurs to invest*, 'Water for All' series, Asian Development Bank, Philippines)

However, there are obviously limits to the effectiveness of small scale water and sanitation providers in serving the poor.

- It may seem axiomatic, but SSWPs are **small**. It is difficult for them to achieve advantages of significant economies of scale, which keeps tariff prices high for customers. Some types of SSWPs (such as pushcart vendors) can only supply small amounts of water per day.
- In many cases SSWPs are considered **illegitimate** by governments or utilities, causing numerous logistical and financial difficulties (McGranahan et al 2006).
- The **quality** of water sold by SSWPs may not meet health or environmental standards. In these cases standards are difficult to implement and enforce (McGranahan et al 2006, p9).
- **Finance** is difficult to obtain at competitive rates for most small scale operators in this sector, due to their illegitimacy and the perception that serving the poor is unprofitable.
- With some types of SSWPs, such as water kiosks, **customers are forced to travel** (sometimes long distances) to purchase and collect water, and then carry it back to their homes. This labour usually falls to the women of the household, further propagating existing **gender inequalities**. "Women are most often responsible for collecting and transporting water for up to 4 hours per day… Lack of access to safe water and private sanitation facilities prevents girls and young women from attending school" (Mitchell, Willets and Carrard 2007 p4).

And of course, as McGranahan et al (2006) point out, "improvements in the services delivered by [SSWPs] are still likely to fall short of the ideal of piped water in every home" (p4). Such improvements can, however, definitely represent progress in people's living conditions.

Southeast Asia

Markets for SSWPs in Southeast Asia are extensive – they are usually the main providers in the substantial areas that do not have access to utility connections, as well as supplementing supply in utility-served areas.

According to a water survey of 18 Asian cities completed by the Asian Development Bank in 2002-2003, water utilities in Asia generally underperform - in 2001, "less than 50% of urban residents in Asia were connected to 24-hour water supply" (Conan 2004 p2). Results indicated that South Asian water utilities (ie those in India, Bangladesh etc) cover most residents within their service areas, but service is extremely intermittent – many households only have water for one or two hours a day.

In contrast, utility water supply in Southeast Asian cities tends to be more reliable – of those households that are connected to the utility, most receive between 16 and 24-hour-a-day service and reasonably good quality water. However, usually huge numbers of households within the service area are not connected or served by the utility. The reasons for this are various – service may not yet have extended into fast-growing suburbs and peri-urban areas at the same pace as dwellings are built; there may be prohibitive prerequisites for connections such as proof of land tenure and large lump sum connection fees; geographical factors may be an issue – particularly high or low-lying areas may be difficult to reach for the water utility. Those without a connection are "concentrated in low-income areas and… a large number of them rely on water delivered by small scale private water providers" (Conan & Paniagua 2004 p1). The slow rate of expansion of service by utilities in Southeast Asian cities has also been attributed to lack of ability or inclination to undertake the massive investments needed to expand services into underserved areas. Utilities often cannot raise funds because they charge "low and irrational tariffs that benefit the nonpoor and disadvantage the poor" – that is, those who are connected to the network get water cheaply whilst the poorer segments of the urban population pay comparatively higher prices to SSWPs for (often) lower quality water in smaller amounts (Conan 2004 p7; McIntosh 2003 p).

Available statistics on respective levels of coverage by city utilities and SSWPs are often conflicting, but according to McIntosh "currently, the most important input of SSWPs is

in Southeast Asia, where the coverage of piped systems operated by water utilities is about 50%, with medium-to-high connection fees. Roughly 20–45% of households in Cebu (Philippines), Ho Chi Minh City, Jakarta, and Manila may rely on water supply services provided by SSWPs" (2003 p47).

Case Studies

These case studies were compiled from available data in the literature published between 2003 and 2007.

Manila (Philippines)

Metro Manila, the Philippines' capital city, is the site of a large-scale privatisation of the city's water utility. In 1997, Manila's Metropolitan Water and Sewerage System (MWSS) turned its operations over to two private consortiums: Manila Water Company Inc. in the east zone of the city, and Maynilad Water Services Inc. in the west zone[1].

According to McIntosh, only 58% of the 12.4 million people in the service area of MWSS receive piped water (2003 p152). Many of the remainder obtain water from small-scale providers. These vary, as in many cities in Southeast Asia, from pushcart water vendors through to small piped networks that operate 24 hours a day. The concession contracts actually "confer exclusive service rights upon the concessionaires within their service areas. However, measures contained in the contracts provide incentives for the concessionaires to allow alternative providers to operate in areas not served by the formal piped networks" – in particular , areas covered by such 'alternative providers' can be counted towards service expansion targets contained within the contracts (Castalia Strategic Advisors 2004 p37).

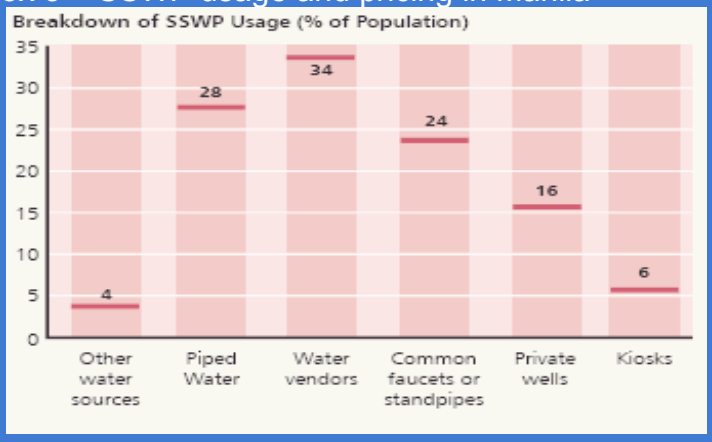
Proof of land ownership and large connection fees are required before households can obtain a connection to the utility. Encouragingly, one of Manila's concessionaire water companies, Manila Water Company Inc., recently waived the land tenure requirement for new connections (Asian Development Bank 2007 p4).

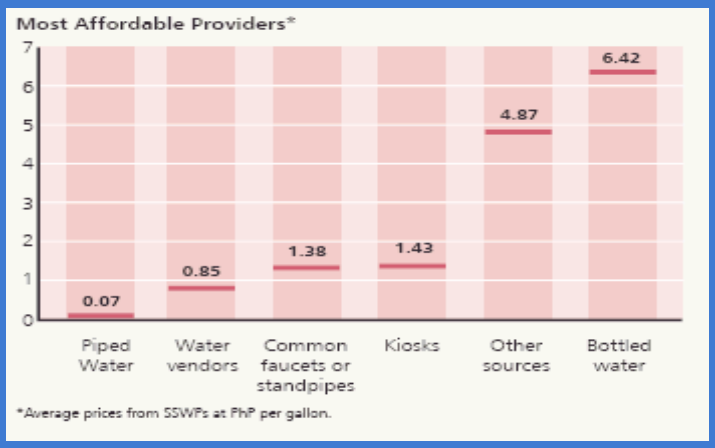
[1] (For further discussion of MWSS's privatisation see Appendix 1 in McIntosh 2003, and J. Budd and G. McGranahan 2003).

An Asian Development Bank survey of some SSWPs and their customers in Manila found that of 13 791 households served by SSWPs, only 28% had household connections from small piped water networks. The remaining 72% rely on non-piped sources, i.e. pushcart or truck vendors, or kiosks – see Box 3 (ADB 2007 p3). SSWP-served households earn an average of $261 (US) of which around 5% is spent on water.

SSWPs operating small piped water networks connected an average of 208 households each. These providers had been in business for an average of 9 years, “remaining modest companies” (ADB 2006 p2). Tariffs charged by these small piped water networks range widely from 5–130 pesos (US$0.10–2.70) per cubic meter (m3).
Other SSWPs include tankers and pushcart vendors, which are usually more expensive but also more numerous and accessible to low-income customers.

Box 3 – SSWP usage and pricing in Manila





Taken from Asian Development Bank water supply service market survey, 2007

Much attention has been paid in the literature to Inpart Engineering (more recently known as Inpart Waterworks and Development Company or IWADCO), a small-scale, family-run private water provider that is seen by many as Manila's biggest success story in this sector, supplying over 25 000 households in 14 areas of Metro Manila (Conan & Paniagua 2004 p6). 70% of these households receive their water from a hose connected to their homes, and 30% have piped distribution (McIntosh 2003 p195). Initially Inpart started water distribution through hose connections from groundwater wells (McIntosh 2003, p195). When the MWSS was privatised in 1997, Inpart saw the potential to deliver

water service (via small piped networks) to areas not served by the large concessionaire companies. Mostly these were poor communities, long term squatter areas where utility services did not extend because of a lack of land tenure. However, no commercial credit was available to provide the capital to expand services to these communities for the following reasons:

- Inpart's activities were not officially recognised by the water utility or its concession contracts, making it a higher risk investment.
- The business of providing water to people below the poverty line was viewed by banks as unprofitable – Inpart estimates that 95% of its customers are below the poverty line (Conan & Paniagua 2004, p6; Tigno 2008; McIntosh 2003, p195).

Inpart has had to borrow money from various sources – relatives, friends, and other non-bank investors – at extremely high interest rates of between 5 and 20% **per month** (not per annum) and at short repayment periods (McIntosh 2003, p196; Conan & Paniagua 2004, p6).

This means that tariffs for Inpart customers are higher than those charged by the concessionaires. Tariffs are higher for other reasons:

- The large concessionaire companies charge commercial rates (12.5 pesos/m^3) for the bulk water purchased by Inpart for its small piped water networks.
- 20% of the tariff goes to an employee (water tender or *aguador*) who monitors distributed water meters and collects payments from 100-200 households, usually on a daily basis.
- Around 10% goes to the local government.

Box 4: **Comparison of utility water tariffs vs Inpart Engineering tariffs, Manila**

	Concessionaires (averaged)	Inpart (piped household connection)	Inpart (hose)	Water vendors (approx.)
Tariff	**7 - 8.50 pesos/m^3**	**35 pesos/m^3**	**100 pesos/m^3**	**125 pesos/m^3**

(based on data from McIntosh 2003 p195-196)

Inpart's customers are still willing to pay this amount, challenging the perception that supplying poor communities is unprofitable (Tigno 2008; Conan & Paniagua 2004, p6). Inpart's General manager Elsa Mejia, maintains that "Despite the higher price... our customers still generally appreciate our projects because they don't have to pay for service connection fees" (Tigno 2008). IWADCO retains around 30% profit, which is mostly reinvested in infrastructure. Over 5 years Inpart invested $350 000 (US) on infrastructure, 75% of which came from tariff revenue (McIntosh 2003, p195).

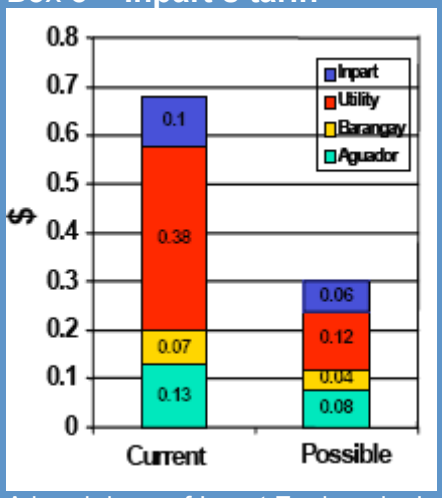
IWADCO's strengths include:

- Low levels of non-revenue water losses (less than 10%) due to a strong metering system maintained by the aguadors (caretakers).
- Negotiable billing periods "depending on customer income flows" (Mejia quoted in Tigno 2008).
- Aguador positions provide sustainable employment in poor communities.

Mejia suggests that if small water providers such as Inpart were recognised by the utility and the concessionaires, finance would be easier to obtain and Inpart's services could expand faster; further, Inpart's services could expand if the concessionaires it charge less for bulk water purchases in recognition of the social service performed by such small providers, as opposed to the commercial rates charged currently – see box 5 (Tigno 2008).

The ADB survey of other piped water providers in Manila in 2006 however, found that most (38 of 46 surveyed) source their water from their own deep wells (ADB 2007 p2). SSWPs that obtain water from their own wells were found to have higher revenues than those that obtained water from other sources (ADB 2007 p2).

Box 5 – **Inpart's tariff**



A breakdown of Inpart Engineering's tariff (US$) when, as is currently the case, Inpart is charged commercial bulk rates ($0.38/m^3), compared to a lower tariff possible if Inpart was to be charged the equivalent of residential rates by the utility (around $0.12/m^3).

Taken from from Conan, H., 2004, *Small Piped Water Networks: helping local entrepreneurs to invest*, 'Water for All' series, Asian Development Bank, Philippines.

McIntosh (2003) compares the model of Inpart Engineering to that of a struggling pushcart water vendor (p194-195)

Cebu (Philippines)

Cebu is the Philippines' second-largest metropolitan area. Most of the city's water supply is derived from groundwater, but growth has meant the water table is being depleted rapidly. The government-owned water utility supplies piped water connections to only 32% of population (Conan & Paniagua 2004 p5).

There is a long list of prerequisites for obtaining a connection from the utility, Metro Cebu Water District (MCWD). The requirements are:

- $100 (US) connection fee
- Evidence of land title or tax declaration,
- Current residence tax certificate,
- Affidavit of house ownership,
- Plumbing permit,
- Applicant's identification card, and
- Completed application form (Conan & Paniagua 2004 p5)

For most people living under the poverty line (an estimated 35% of Cebu's total population), these requirements are clearly near-impossible to meet. Clearly this is the kind of context in which SSWPs step in and cater to demand. In Cebu, people living in areas served by the utility have developed methods of providing water to their neighbours who cannot meet the requirements for a utility connection.

According to Conan and Paniagua there are three main archetypes of SSWP operating in Cebu City:

- A system using water from a private well equipped with a pump selling on to neighbours. This system caters to 10 or 20 households within 50 metres of the site. Usually this involves a standpipe that neighbours collect water from or a small piped water network. Connection to the network is no more than the cost of materials – iron pipes and a water meter – and installation, totalling around US$60. No official documents are exchanged, and billing periods are negotiated between the customer and the operator.
- A system using water from a well connected to a $15m^3$ reservoir. A mains pipe from the reservoir feeds into a piped network catering to an area within a 500-1000m radius. Like the first system, connection costs are no more than the cost of construction. Conan and Paniagua say that this system "offers a service comparable to that of MCWD, but does not require any legal or administrative documentation" (p5).
- A service where household containers are filled three or four days a week by an attendant with a polyethylene hose connected to a well. The connection fee is US$10.

(Conan & Paniagua 2004 p5).

Box 6 – **Comparison of SSWP systems with utility, Cebu**

	MCWD	System (1)	System (2)	System (3)
Initial Investment		US$ 2,000	US$ 6,000	US$ 2,000
Connection Fee	US$ 100	US$ 60	US$ 66	US$ 20
Tariff US$/m3	US$ 0.24	US$ 0.5	US$ 0.8	US$1 to 1.5

MCWD = Metro Cebu Water District
System 1 = neighbours' network
System 2 = reservoir network
System 3 = hose service

Taken from Conan & Paniagua 2004

Conan (2004) provides the example of Virgie Zafra, who installed a standpipe at her home in 1999 and began selling water to her neighbours – serving approximately 20 households with water costing US$1.6 per m^3. She required "clearance from the *barangay*, authorization from the water utility, and a business permit from the City" (Conan 2004 p28).

Two years later Zafra upgraded her service from a standpipe to a piped network 16 household connections. Zafra does not charge a connection fee for the network but requires that customers cover the cost of materials for connection such as pipes and water meters – usually about US$60. Her water tariff in 2002 was US$0.5/$m^3$. Ms. Zafra collects customer's payments herself. Setting up the system cost around US$2000, raised partly from her husband's earnings (Conan 2004 p28).

Her service resembles system 1 in Box 6 above.

McIntosh (2003) provides another example of the Old Philippine Railway Residents' Association sitio[2]. Most of the barangay (community) in which the OPRRA sitio is located is underserved by the utility because it is at a higher elevation than the MWCD's service water reservoir. OPRRA's small piped network is serviced by two wells with reservoirs, and 437 households are connected (p189). OPPRA's water business employs 22 people - one operations supervisor, one maintenance supervisor, six pump operators, six maintenance personnel, six communal caretakers, one watchman, and one security guard (McIntosh 2003 p189). Every 6 months the water is treated with chlorine and the water quality is tested by the Cebu City Health Department Laboratory (McIntosh 2003 p189).

According to surveys of OPPRA customers carried out by McIntosh, OPPRA's requirements for obtaining a connection are easier to meet than those of Metro Cebu Water District – OPPRA requires a deposit and a small connection fee – but tariffs are significantly higher, at around US$0.8/$m^3$ (compared to MCWD's tariff of US$0.24/$m^3$) (McIntosh 2003 p190, Conan & Paniagua 2004 p5).

This system resembles system 2 in Box 6.

[2] *Sitio* means small unit of a community.

According to Conan and Paniagua, all these SSWPs are operating legally with permits from the municipality, the utility and the National Water Resources Board.

Ho Chi Minh City (Viet Nam)

The water system of the government-owned Ho Chi Minh Water Supply Company (HCMWS) lags behind the rate of population growth and economic growth in Ho Chi Minh City. Rapid expansion of peri-urban areas and high water losses mean that the utility cannot expand its service fast enough. According to McIntosh (2003), only about 44% of people have piped water connections to their homes (p145-146). It is estimated that 19% of households use SSWPs (Conan & Paniagua 2004; Conan 2004; McIntosh 2003). Around 19% of SSWPs are water tankers who purchase water from the utility and sell it for around US$0.40/$m^3$; but most (61%) are resellers who sell water from their household utility connection to others for about US$0.56/$m^3$ (McIntosh 2003 p145). Another 11% of SSWPs provide small piped networks.

McIntosh (2003) and Conan (2004) both point to the Phuc Doan Company as an example of a SSWP operating a small piped network in Ho Chi Minh City (HCMC). Interestingly the company has moved into the water supply business from the garment manufacturing business and in fact is HCMC's first private water supply company(McIntosh 2003 p145-146; Conan 2004 p29). Consequently the procedure of liasing with the municipality and the government departments has taken a long time. Phuc Doan has had to invest around US$80 000 to develop the small network system (which extracts groundwater), including money paid to the owners of land the pipes pass through (McIntosh 2003 p146). Connections to the network cost US$33 and the tariff is around US$0.22/$m^3$.
The area that Phuc Doan serves, District 12, is "a fast developing peri-urban area still without paved roads, drainage and sewerage" unserved by the water utility and with abundant sources of groundwater (Conan 2004 p29). Perhaps partly because of the ready availability of groundwater for anyone who can dig their own well, initially the uptake of business for Phuc Doan's small piped network system was slow – the network had the

capacity for 2000 connections but within the first three years of operation only 400 households were connected (Conan 2004 p29; McIntosh 2003 p193). This could also be attributed to Phuc Doan's billing periods, which are monthly rather than weekly or daily, or the cost of the lump sum connection fee.

In recognition of the fact that HCMWS could not meet demand, 2001 saw the municipality starting to develop legislation to 'socialise' investment in small scale water providers – that is, create a program to encourage investors to invest in small scale water networks. Under this framework, the Department of Public Works, the Department of Planning and Investments, and the People's Committee of Districts select areas where the support will be given to SSWPs. Investors must go through a tendering process. If successful they receive 5-year tax exemptions. The utility is required to support entrepreneurs to source materials. However, under the scheme, SSWPs are required to meet the same technical standards as the utility, rather than seeking low-cost alternatives (Conan & Paniagua 2004 p4).

Tax exemptions seem an excellent way to encourage investment in the water sector, but making these exemptions conditional on SSWPs meeting the same technical standards as the utility, as well as operating in areas chosen for them by the three departments, seems to dampen some of the identified strengths of the private sector – that is, cost efficiency and responsiveness to demand.

Strategies to increase effectiveness of SSWPs

Small-scale water providers have been nominated as having a major role in meeting the Millennium Development Goal of reducing by half the proportion of people without sustainable access to safe drinking water and adequate sanitation by 2015.
From the case studies and available literature, what strategies are there to increase the effectiveness of SSWPs in expanding and increasing quality of service?

- **For governments:**

Governments at all levels (national, provincial and local) should formally recognise the importance of SSWPs' role in service provision. Accordingly, any laws prohibiting the private sale of water should be modified. The significance of doing this should not be underestimated – it would bestow increased legitimacy on the businesses involved, improving their reputations and increasing their chances of obtaining credit at competitive rates. Other measures to encourage entrepreneurs and investors could include tax exemptions for small water businesses, as seen in Ho Chi Minh City, or low-interest start-up loans from government (Conan & Paniagua 2004 p4).
Governments should attempt to regulate for higher water quality without enforcing standards that are prohibitively high for most SSWPs. The idea is to make investing in communities' water service attractive.
Finally, SSWPs should be considered and consulted by governments in the formulation and implementation of future water supply strategies rather than ignored or marginalised.

- **For utilities:**

Utilities should be encouraged to work with SSWPs, and facilitate formal deals for bulk water supplies. Rather than charging more to the SSWPs that sell to the poor whilst those already with a utility connection pay "irrational" lower tariffs, bulk water should be sold to SSWPs at somewhat discounted rates in recognition of the public service they provide. By working with SSWPs, utilities would benefit from having less lost or non-revenue water from illegal connections and stronger revenues (McGranahan et al 2006 p4). Utilities could also support SSWPs on technical issues – for example encouraging the purchase of low-cost water quality testing kits.

- **For small scale water providers:**

SSWPs should be encouraged to integrate some form of water quality testing into their business model and should attempt to engage with government on health and environmental regulations as much as possible. This will obviously depend on local factors, but it is worth noting that most SSWPs surveyed by the Asian Development Bank in Manila were not aware of their supposed legal obligation to secure a 'water permit' from the National Water Resources Board (ADB 2007 p2).

Conclusion and suggested further research

Small scale water providers throughout Southeast Asia play a currently indispensable role in supplying water to low-income communities. This is likely to remain the case for some time, and recognition of their role is growing. Research in this field has challenged myths formerly flung about with regards to SSWPs – particularly the idea that all SSWPs are exploitative (Solo 1999). Certainly some are, but the overwhelming majority are usually forced to charge rates higher than those charged by utilities due to factors beyond their control. Further, it is evident that the poor can and do pay these higher prices for water, leading some to argue that utilities should charge higher tariffs to those already connected in order to raise the funds necessary to expand (cheaper) service to those currently relying on more expensive SSWPs (McIntosh 2003). For many though, utility service is a long way off – increasing investments in SSWPs will contribute greatly to achieving the Millennium Development Goals in water and sanitation.

A question that warrants further research is that of regulation – to what degree can SSWPs be regulated (for quality, standardisation, etc) without compromising their identified strengths – such as flexibility and adaptability – or indeed putting them out of business? As McGranahan et al (2006) state, "despite all their local diversity, one of the most common afflictions of SWEs [small water enterprise] regulation is that standards are set so high that SWEs cannot comply without drastically reducing water provision"

(p11). McIntosh (2003) argues that there is no need to regulate SSWPs, contending that "to a large extent, the market promotes regulation through customer choice concerning price and quality of water" (p51). Are market forces enough, as McIntosh maintains? What kind of frameworks can best encourage high standards of water quality at the same time as encouraging high standards of customer service and more investment in this sector from local entrepreneurs?

This paper has not dealt with sanitation issues, but sanitation is equally important as, and intertwined with, water issues. There is a pressing need for more research into small scale providers in the sanitation sector and how to encourage entrepreneurs and investors to enter this field.

In the end it is important to stress the particularity and uniqueness of each case – each kiosk, trucker, vendor, and piped network operator in each city and town has different ways of operating and engaging with customers, authorities, and their environment. The environment and relative success of SSWPs will be different in each location. Generalised recommendations can of course only go so far.

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