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The Prospects for Social Business in Peri-Urban Water Supply: Employment and Household Welfare Impacts of the Grameen Veolia Venture

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Introduction

This paper evaluates the potential for positive changes in household welfare and employment stemming from the institution of social businesses for water supply in peri-urban environments. [1] This analysis uses the experience of Grameen Veolia in the peri-urban space of Dhaka, Bangladesh as a key case for evaluating the concept of social business. The study uses interviews with Grameen Veolia employees, primary project documents, and secondary sources in the grey literature as evidence.

Given the recent origin of both the Grameen Veolia venture and the social business concept, the findings should necessarily be classified as exploratory. However, the Grameen Veolia case suggests that social business could both increase aggregate employment and alter the gender composition of employment of villages in a positive manner. While this intervention could only be scaled to a limited number of villages and have an incremental impact, it is relatively easy to implement. The flexibility of a social business for water supply, demonstrated by Grameen Veolia, is particularly relevant in a context such as peri-urban Dhaka, where climate change makes both employment and water supply sources unstable.

The Peri-Urban Context: Goalmari

The Graameen Veolia social business began in the peri-urban area of Dhaka. The first project, which comprised a water treatment plant and distribution system, became operational in June 2009 in the villages of Goalmari Union, which is located 50 kilometers east of Bangldesh's capital city. Goalmari was selected as a test site because it was the poorest area in its district and has acute arsenic pollution in its groundwater supply.

The peri-urban environment can be defined as settlements in the urban periphery, within the greater urban area but not within the city boundaries. Generally, peri-urban areas are

[1] A separate paper (Pierce, 2013) evaluates the practical prospects of social business to provide clean water to households currently lacking it across a wide swath of low and middle income countries. Clearly, the question is not whether social business can provide a universal solution to local water deficits. Rather, it remains an open question whether social business can serve as a better or complementary alternative in any cases where the government, non-profit and private sectors have failed to provide adequate service.

characterized by insecure land tenure, inferior infrastructure, low incomes, and lack of recognition by formal governments (Hogrewe, Joyce and Perez, 1993). Particularly key in terms of water access, these areas often are neglected or singled out for exclusion by government agencies. This means that residents of peri-urban areas cannot easily hold any entity responsible for deficits in basic service provision (Prakash, 2012).

While peri-urban communities can be quite close to the city center and thus contiguous with the city's built environment, Goalmari is on the outer fringe of what could be considered the peri-urban space of Dhaka. In fact, Goalmari is often classified as a rural area (see for instance, Grameen Veolia, n.d.). Accordingly, the residents of Goalmari cannot expect to reasonably demand service provision from the city system in the near future, but rather rely on supply techniques that are more appropriate for rural areas.[2] However, the success of Goalmari's social business venture calls has depended on direct interaction with the core urban area of Dhaka. This strong tie to Dhaka suggests a peri-urban or semi-rural classification for Goalmari is most appropriate, so the terms semi-rural and peri-urban are used interchangeably in this report to describe the area.

The Literature on Water Provision to Peri-Urban Communities

In semi-rural areas in low and middle income countries, providing in-home piped water is almost universally infeasible due to the high fixed costs of infrastructure. Due to incomplete decentralization of authority and funding, local government offices often cannot or do not provide any clean, reliable water service. Given the clear institutional space and room for welfare improvement, international NGOs and formally organized civil society groups have also emerged as water service providers. Yet both local government units (Wisner, 2001) and NGOs (Whittington and Mcrae, 1988) have often employed a build and leave strategy that has failed to effect substantive, sustained increases in access. Water projects are typically doomed by inappropriate technological, a lack of financing for maintenance and a simple lack of presence by the provider.

An alternative approach for semi- rural water allocation is organized, demand-responsive community management. A UNDP survey of 125 communities in six countries found that projects which charge households for water and give them options for service— i.e. are demand responsive— are more successful than supply focused projects, even after controlling for poverty level, the cost of project and other factors (Katz and Sara, 1997). The study also emphasized that the design and implementation of rules for decision-making and inclusion— governance— was the key factor for success. Governance practices, however, were varied across communities. A later comparative study by Whittington et al. confirms that

[2] Yet even among those who benefit from the country's most consistent service delivery system in the capital city of Dhaka, 90% of households who receive in-home piped water have to boil it before use (Haq, 2005). This example demonstrates that there are still substantial labor and resource costs to obtaining drinkable water in addition to the nominal price of purchase in the 'best-case' public provision scenario in Bangladesh.

community- managed, demand driven water can succeed over the long term, with some level of sparse technical assistance, drawing on evidence from 400 rural communities in Ghana, Peru and Bolivia (2009). The Grameen Veolia project originated from the initiative of a typical NGO approach, but has rapidly shifted to a hybrid of self-management and NGO assistance with entrepreneurship (and the related incentive for profit) playing a large role.

In Bangladesh, rural and peri-urban communities typically rely on public standpipes drawing on ground water. Since Bangladesh is endowed with an abundance of raw water resources, there is fairly extensive service coverage in rural communities. The quality and security of water sources, however, is another matter. Even though surface water is abundant, because of industrial pollution, it often requires extensive treatment before consumption, so residents have instead tended to obtain water through water boreholes that extract shallow groundwater. Even in the greater Dhaka area, as of the year 2000, about 95% of water for industrial and domestic use was drawn from under the ground (Khan and Siddique, 2000). Yet groundwater quality also remains a major concern because salinity, iron and especially arsenic contamination cause serious health problems for households that rely on standpipes (DIPECHO and ActionAid, 2012).

Moreover, eighty percent of the country's land area is comprised of floodplains. Three major river systems, the Ganges, Brahmaputra and Meghna, flow from the Himalayas in the north to the Bay of Bengal in the south. Bangladesh is also located in a monsoon-prone area of South Asia (Khan and Siddique, 2000). As a result, frequent flooding damages and contaminates supply infrastructure. This makes maintaining peri-urban water supply infrastructure very challenging. Deficiencies in semi-rural water supply thus reflect not only a shortcoming in ecological sustainability but also in social sustainability (Vidal, 2012). Although raw water is abundant, a lack of quality and reliable supply remains an endemic problem.

Recognizing this dual ecological and social resilience problem, Grameen and Veolia established their joint venture in March 2008 (see Pierce, 2013 for more detail regarding the motivation for this venture from the suppliers' perspective). The rationale for choosing Goalmari Union as a demonstration site was clear. First, Goalmari was the poorest area in Comilla district, so improving household welfare was a priority for the venture. Moreover, 83% of wells in Goalmari Union contained arsenic at the time of the program's commencement. Other mitigation efforts had been tried since arsenic contamination was first detected in 1993, but to no avail (Yunus, Lesueur, 2012). Accordingly, this project utilized surface rather than ground water as the main source of supply.

The Literature on Employment in Water service in Peri-Urban Contexts

As above, the discussion of viable service provision options for semi-rural communities has typically excluded the role of the private sector. Yet, private interests are very active in peri-urban water supply, through the presence of water vendors, infrastructure wholesalers and

technicians and even public private partnerships. [3] Each of these roles also provides local paid employment, a factor which is not considered in standard views of water supply, but is a main consideration of this analysis. Across or within single low and middle income countries, there are no good sources of systematic data on the number of individuals employed in providing water, their earnings or other demographic characteristics (Opryzsko et al., 2009).[4] Information regarding employment in water provision is largely limited to case studies, the largest literature of which is on individual water vendors.

Water Vendors

Given the status quo of water utility dysfunction, between 25-75% (estimates vary widely) of residents in cities in the developing world remain underserved or completely unserved by municipal networks. Most of these individuals wind up relying on a wide array of private water vendors for their daily needs. Depending on the degree of leverage households and communities retain to engage with the state, obtaining services from private vendors may be preferable or necessary. Vending is here defined as any resale or further distribution of utility or publicly available water (Kjellen and McGranahan, 2006). Water vendors may be local community members selling water from their own-in home tap to make a modest living or represent larger private firms that trade in other (sometimes illicit) goods.

Water from vendors typically costs much more than public sources, although vendors do not necessarily make a large profit. In any case, the poor ironically wind up paying more for poorer-quality, private water that is nominally labeled a public good. Whittington was one of the first scholars to demonstrate the utility of water vending in a WTP study conducted in the town of Ukunda, Kenya (1989). In this community, 45% of water consumed was delivered by private vendors by cart to individual households. While prices were high and represented a significant proportion of HH income (households spend 9% of income on vended water), vendors did not make that make a large profit once costs were subtracted from revenues.

Kjellen and McGranahan reflect the leading stance in the literature: water vending does not represent an ideal market, but should be viewed as a symptom rather than a cause of insufficient public water provision (2006). However, our understanding of water vendor activity is almost exclusively confined to core urban areas and to the service delivery, rather than the employment impacts, of vending.

Infrastructure Wholesalers and Technicians

In addition to the sale of water to households, individuals employed in installing and maintaining water infrastructure are ubiquitous in semi-rural areas. These individuals may be local masons who work on water among other semi-skilled labor tasks, or salesmen peddling hardware such as pipes, spigots and jars. Masons are essential to insure that water infrastructure is installed correctly, which can have profound impacts on health. This is especially true in Bangladesh given that such hardware is likely to encounter frequent

[3] Surprisingly, the demand for clean water by commercial enterprises in small or peripheral urban areas is fairly limited (for instance, see Davis et al. 2001).

[4] I am attempting to compile and analyze systematic data on employment in water provision from the 2010 Bangladesh Household Income and Employment Survey, but this process is in the stage of date collection and is thus not ready for review.

flooding (Ahmed, 2008). The activities and characteristics of masons has not been explored in detail, but are generally assumed as a natural part of local economies.

Analysis of those employed in infrastructure wholesale is more rare even than that of masons in individual villages. Households in semi-rural areas either have to travel long distances to hardware stores or buy water hardware from traveling salesmen. Ideally, vendors are employed by mid-sized domestic firms which offer both growth opportunities and some degree of job security, rather than being independent entrepreneurs or loosely affiliated with multinational companies (Dardenne, 2006).

Public Private Partnerships

Finally, there is some grey literature on the presence of formal public private partnerships in semi-rural areas. Public private partnerships (PPPs) are agreements where private firms provide water infrastructure or service, but are regulated by the public sector (Delmon, 2011). Private firms do not own the water but operate hand pump or piped systems (which are more common) at the discretion of the local government. Still, PPPs are often controversial. For instance, the Indian government and World Bank have promoted the *Swajal* program in recent years, which provides initial support for water infrastructure but then calls for local contractors to provide operation and maintenance services (Manthan, 2007). This devolution of service provision has encountered fierce resistance from domestic environmental and human rights activists.

However, the prevalence of these arrangements is growing in diverse institutional environments, although they tend to be more prevalent in civil law rather than common law countries because delegation of management of public services is better codified in civil law nations (Kariuki and Schwartz, 2005; IRC et al. 2012). These ventures may support very low levels of local employment. A study in Madagascar describes a piped rural water supply system to a town of 25,000 as employing seven local people, hardly a boost to livelihood generation (Annis and Razafinjato, 2011*)*. However, many other PPP arrangements facilitate more local employment..

For instance, hand pump arrangements can be organized so that local water user associations (WAUs)—which are ubiquitous in rural and semi-rural villages— collect fees for service from local community members and pool these to pay individuals or small firms to provide maintenance (IRC, 2012). This returns any money spent on water to the community.

The Peri-Urban Water Employment Market in Bangladesh

There has been a large and successful governmental and NGO effort to introduce water supply hardware into semi-rural areas in Bangladesh (Shamsuddin, 1999). However, the private sector has also asserted itself because public programs have emphasized hardware and not usage of infrastructure, and have not been diverse enough to meet local needs. Even in communities where free or highly subsidized hardware is offered, the bureaucratic obstacles to obtaining or using it may outweigh the monetary cost of buying from private vendors, who

also are better at maintenance (DANIDA, 1999). In other words, the revealed preference of households in some peri-urban communities is for private service.

Accordingly, the Water and Sanitation Program of the World Bank estimates that about two-thirds of the rural supply sector in Bangladesh is serviced by the private sector (2000). Because there is lively competition between private suppliers and NGOs, technology is improving and the cost of service is decreasing. In other words, the competition of service delivery providers is not harming consumers. Due to the availability of shallow groundwater, hand pumps have been the most feasible technology employed at the community scale. Since the enormous arsenic contamination problem in Bangladeshi groundwater has been discovered, however, a transition is being made to surface water treatment.

In terms of direct labor market impacts, employment in water provision is largely peripheral or supplementary. Most communities are served by a pool of agricultural workers that supplement their income by contracting out their services as drillers or masons for water infrastructure. One constraint to individual water entrepreneurs is that while credit to buy hardware is available for customers— microfinance is ubiquitous in Bangladesh— it is difficult to find for fledging manufacturers and distributors.

In short, private sector participation in rural water appears robust in Bangladesh. The quality of services is handled fairly well by market competition, although government oversight is still beneficial. There is, however, a question of long-term sustainability in terms of supply that may be better addressed by the social business model explored below.

Employment opportunities in semi-rural BD villages

How does employment in water vending and supply fit into local semi-rural economies? The range of livelihood opportunities of the poor in semi-rural areas is very limited. Subsistence agriculture, whether contracted as a day laborer or self-employed, remains the dominant form of employment (BDI, 2010; Khandker, Ahmad and Khan, 1998). However, this occupation offers very limited upward mobility and is particularly prone to instability due to climate change. There are a host of government and NGO livelihood programs operating to support transitions to more remunerative opportunities. These programs provide varying levels of support and demonstrate some effectiveness, but wholesale change is likely to be driven by exogenous forces.

Since the 1990s, gainful wage employment in non-farm activities has been growing (Mahmud, 1996; Mahmud, 2003). While jobs at firms that have real growth opportunities are ideal, these are still extremely limited as the structure of Bangladesh's economy evolves.[5] A second-best alternative is self-employment in the operation of small shops or businesses

[5] Of course, working as a wage-earner in a peri-urban garment factory could be classified as this type of labor, so care must be taken in over-generalizing the desirability of generic occupations.

(BDI, 2010). In semi-rural areas, there is also often more opportunity for appreciable welfare improvement if explicit connections to urban markets can be made.

Until very recently, the role of women in the labor market has been tightly circumscribed. Gender roles are fairly rigid in Bangladesh, and women have traditionally been confined to 'reproductive' rather than 'productive' roles. (Mahmud, 2003). The combinaton of a lack of remunerative opportunities also suppresses women's abilities to advocate for their rights (Hasle, 2003). This rigidity is, however, loosening slowly and employment in social businesses for water supply may provide some employment opportunities.

The role that social business for water can play in perpetuating or changing these dynamics in semi-rural areas is discussed below. The scale of change offered by social business will be incremental. Using Moser's conception of practical and strategic needs, the opportunities afforded by social business should be seen as practical but potentially bridging to strategic changes (1989).

I use Grameen Veolia's experience as a key case for analysis. A case study was deemed appropriate for this analysis because the phenomena is very contemporary, the context is not suitable for experimental design and involves collective factors not easily captured in survey analysis. Most importantly, the study attempts to trace out the 'how' and why' of these phenomena. These criteria for a single case study are explicitly outlined by Yin (2003).

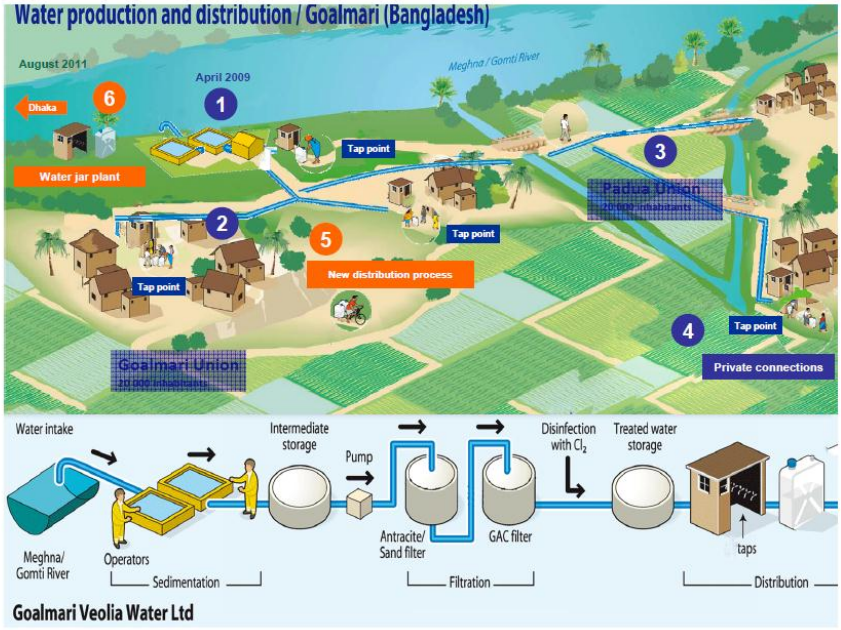
The Evolution of Employment in the Grameen-Veolia Venture

The content and extent of the Grameen-Veolia water supply project has changed dramatically since its inception (Figure 1 represents the most current iteration). Changes are fundamentally related to the nature of employment in the venture, but also extend to the strategy of the initiative itself (Yunus, Lesueur, 2012). The key change has been to develop from a top-down approach to a collaborative 'hybrid value chain,' where changes in service delivery are driven by local ideas and actors who have incentives to promote the venture (Ashoka, 2005).

First-Stage: Equitable Employment Limited by Fixed Network Approach

Against conventional semi-rural supply methods, this project relies on surface water and explicitly aims to break even. Otherwise, the first conceptualization of the project was rigid in terms of the service delivery format. By 2009, a treatment plant, 2 kilometers of piped network and 11 communal taps were in place to deliver water to the residents of Goalmari (Yunus, Lesueur, 2012). Distribution relied on a fixed network approach and charging a uniform tariff for the volume of water used.

Figure 1. The Grameen Veolia Purification and Distribution System



Source: Grameen Veolia Limited, 2011.

The management structure of this fixed network was more innovative. Communal taps were granted as no-cost 'franchises' to women who had previously established a borrowing record with the Grameen Bank. Water dealers were first nominated by other villagers, and then Grameen Veolia selected its choices among the nominees. Candidates were selected based on some exclusionary criteria. For instance, basic literacy was valued because tabulating sales was a vital part of the job, although in some cases children were able to assist and thus help women overcome this barrier.

Tap managers received a percentage of the fees they collected.[6] This structure provided potentially valuable, semi-autonomous employment for females in the community. The value of this business in the first stage, both to the community and to the dealers, however, was limited. In fact, some tap monitors actually stopped operating their franchise due to a lack of revenue.

The reason for this was that demand for Grameen-Veolia water was much lower than initially expected. Project implementers had failed to consult community members about several key aspects of the service delivery framework: how the water would be distributed and the (existence of a) price. Community members could and did obtain water from other sources,[7]

[6] The current system gives 20% of total sales (0.5 Taka for every 2.5 taka sold for 10 liters) to tap managers.

[7] Before Grameen Veolia, most water was obtained from running or stagnant sources nearby. Vendors were not present in the village of Goalmari, but were active in a nearby peri-urban center.

a reality that initially escaped Grameen Veolia, which assumed it would capture the entire market. The reality was that the program was competing with free (but dirty) water supply. Despite the large investment, because it employed a top-down approach, the project did not come close to recovering variable costs in its first stage of operation.

Second-Stage: Radical Readjustment to Market Realities

Just a few months after inception, the flexibility of Grameen Veolia's business model allowed it to recognize its flaws and rapidly adapt, rather than continue with a failed strategy. This contrasts sharply with the practice of many governmental and NGO water supply systems, where elaborate infrastructure is built but under-utilized, and no subsequent effort is made to salvage value or improve outcomes for the supposed beneficiaries.

In Goalmari, project implementers recognized that their objective— increasing clean, secure water access at break-even variable cost— was not close to being recognized. Accordingly, the network was adjusted in two ways. After consultation with residents and taking into account the implicit time and labor costs of obtaining water outside the home, tap points were moved much to residences. Moreover, payment details were made more flexible. In short, after an initial failure, the details of delivery were tailored both to the built environment and households' livelihood concerns rather than based on engineering or optimization logic.

To better finance the system, the program also expanded the network to more extant villages and began to service five individual connections to homes and schools, for which it charged a higher price than for water coming through communal taps (Grameen Veolia, 2011). System expansion also required hiring more female employees. Grameen Veolia had originally intended to provide water to the local area through communal taps to ensure that the poor, disadvantaged would be served first, but ironically discovered that the only way to feasibly serve ts target recipients was to cross-subsidize the scheme. Again, making these adjustments seems intuitive for a profit-minded enterprise, but demonstrates a flexibility that is not typical among water supply providers.

Third-Stage: Accounting for Socioeconomic Realities

This flexibility was further demonstrated in the third phase of the project. Between August 2010 and April 2011, the Drishti Research Center conducted a detailed anthropological study to provide program implementers with a better understanding of the area's socioeconomic dynamics and residents' opinions regarding the importance of clean water. This study was conducted using 'Bottom of the Pyramid' Protocol 2.0 and the rapid Participatory Rural Appraisal methods popularized by Robert Chambers. In other words, the research was conducted in such a way as to deflate any criticism of a top-down approach.

Most interestingly for the scope of our study, the extent and incentive system for employment was changed. Because women were not earning enough to continue working, Grameen Veolia added a bonus system for tap managers. If monitors sold 2,000 liters in a month, they received a 100 taka bonus, with higher bonuses apportioned on an escalating scale. Following the institution of this scheme, dealers now earn about 700-1000 taka (US$8.78-12.55) a

month.[8] This level of remuneration is still insufficient to support a family, but the hours required by the job are also far less than full-time. In addition to increasing wages for existing workers, Grameen Veolia hired five auxiliary employees to walk door- to-door in the communities monitoring customer satisfaction and selling water delivered in jars. These alterations to the distribution increased monthly sales nearly three times in Goalmari and Padua Unions between January to August 2012.

Fourth-Stage: Expansion to Urban Areas

The Veolia Grameen initiative continues to evolve, but the final stage in the project that is considered in this analysis represented a significant departure from previous iterations. In 2012, the program launched a jar business in peri-urban centers and Dhaka. Recognizing the high demand for potable water in the city, male entrepreneurs in the Goalmari region had begun buying water wholesale and re-selling it in 20 liter jars.

Grameen Veolia, instead of frowning upon this activity as many government or NGO suppliers would do, institutionalized the re-sale of the jars in Dhaka city and other local markets. Dhaka is, not surprisingly, by far the biggest market for jars. Jars are transported by boat from the Goalmari treatment plant to a warehouse in Dhaka City. From there, distributors pick up the jars and deliver to businesses throughout the city. All the profit from the wholesale business is diverted to the scheme in Goalmari. The magnitude of this cross-subsidization of peri-urban consumption is considerable. Grameen sells an average volume of 4,600 jars per month, and this number is likely only to rise (it doubled between January 2012-August 2012). In short, the addition of this method of sale is likely to be the main driver of cost recovery and ensure the sustainability of the semi-rural supply in the future.

The labor implications of this phase of the project also dramatically departed from previous experience. The wholesale business almost exclusively employs men, due to the physical nature of the work and the extensive travel required across the urban area (which is not easy for women in Dhaka).

The number of people employed also dwarfs the business in Goalmari and its surrounding environs. Each whole sale distributor employs three-five employees. In theory, whole sale distributors have the opportunity to make a sizeable profit. While they buy water at 5 Taka per 20 liter jar, they can often sell at 20 or 30 Taka. To date, however, wholesalers have only made marginal profits (HEC, 2011). Nevertheless, Grameen Veolia's lack of control over this segment of the market has led it to push for local governance of these new distribution points (HEC, 2011).

[8] As of January 1, 2013 1 U.S. Dollar=79.7 Bangladeshi Taka (source: www.xe.com/ict)

Figure 2. Grameen Veolia Promotion at Market in Goalmari

Source: Grameen Veolia (2012), https://www.facebook.com/photo.php?pid=1173481&l=c51c9657bf&id=337737212939056.

Policy Implications and Conclusion

The Grameen Veolia venture is, if nothing else, dynamic. In a period of less than four years, the distribution network of Grameen Veolia has transformed from one fixed service delivery mode, the costs of which dramatically exceeded its revenues, to a multi-faceted distribution platform which subsidizes water access in semi-rural communities. Moreover, employment opportunities stemming from the program have increased dramatically in affected semi-rural and peri-urban areas. However, given the unique circumstances of the initiative's funding and stakeholders, what is the real scope to replicate or extend this type of venture?

First, it is clear that social businesses that provide water supply in low and middle income countries will remain the exception, rather than the norm. They require substantial upfront investment which, even if recoverable from user charges, is prohibitive in terms of scale. The argument here is not that social business for water is the solution for peri-urban water or employment deficits. In the short term, it is a practical and partial response to a crisis of basic service provision, but one that has the potential to effect more strategic and structural change over time, as demonstrated by Grameen Veolia.

Dismissing the prospect for social business in some instances because it will not work in all (or even most) is misguided, unless one can propose constructive alternatives. In this case, social business can serve as one of several strategies employed simultaneously to ameliorate water access and employment opportunities. As opposed to for-profit enterprises, social businesses aim to prioritize the end-user's interests, can be effectively taken over by local residents after the initiatives achieve variable-cost recovery.

Social businesses which enhance water supply are most likely to succeed in peri-urban or semi-rural contexts. There are several reasons for this. On the one hand, urban areas do not have the institutional or physical space for non-governmental water treatment ventures, and these are also largely unneeded (political obstacles are the bigger problem). At the other extreme, as the case of Grameen Veolia has shown, social businesses for water confined to one rural or semi-rural region are unlikely to succeed on a cost-recovery basis. The peri-urban context both provides a vital service to a radically underserved community, and affords the means to cross-subsidize this service due to increasing water insecurity in core urban areas. Perhaps most importantly, the unclear governance regime operating in many peri-urban and semi-rural contexts necessitates the type of iterative 'muddling through' that Grameen Veolia has employed to date, and that is so often eschewed by more established stakeholders (Lindblom, 1995). While this type of iterative effort is not likely to transform the service delivery or local employment paradigms, they can and should be pursued to address pressing peri-urban demand for improved livelihoods and health.

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