

Innovations in Municipal Service Delivery:  
The Case of Vietnam's Haiphong Water Supply Company

by

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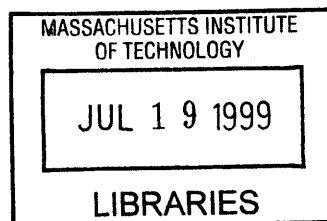
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# INNOVATIONS IN MUNICIPAL SERVICE DELIVERY: THE CASE OF VIETNAM'S HAIPHONG WATER SUPPLY COMPANY

by

JOYCE ELENA COFFEE

Submitted to the Department of Urban Studies and Planning on 21 April 1999 in partial fulfillment of the requirements for the degree of Master in City Planning

## **ABSTRACT**

This thesis describes a state owned municipal water supply service company, the Haiphong Water Supply Company (HPWSCo), that improved its service delivery and successfully transformed itself into a profit making utility with metered consumers willing to pay for improved service. The thesis examines how HPWSCo tackled the typical problems of a developing country's municipal water supply company and succeeded in the eyes of the consumers, the local and national governments, and the wider development community.

The thesis describes how and under what conditions HPWSCo has changed itself from a poorly performing utility to a successful one. It explores the characteristics of the local level service delivery 'ward model' that underpin HPWSCo's success, including: the structure of the ward water supply sub offices; the local procedures for responding to consumer need; and the management of local employees in a way that motivates exemplary performance. The thesis examines how HPWSCo used existing resources and scaled-out improvements ward by ward, learning lessons for subsequent ward enhancements. By focusing on what HPWSCo did the thesis attempts to illustrate the reform strategy of a government agency (state owned enterprise) previously riddled with problems and poor performance that became much more effective and efficient.

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# Innovations in Municipal Service Delivery: The Case of Haiphong Water Supply Company

## Contents

<b>ABSTRACT</b>	3
<b>I. Introduction</b>	9
A. Water Supply Service Delivery in Developing Countries	9
B. Haiphong, Vietnam and the Ward Model	11
C. Case Background	14
D. Research Questions	16
E. Research Methodology	17
F. Thesis Organization	17
<b>II. Haiphong's Previous Water Supply and Indicators of its Transformation</b>	19
A. Pre-Innovation Haiphong Water Supply	19
Table 1: Selected Indicators HPWSCo's Successful Transformation	23
B. Improved Utility Performance	24
C. Improved Consumer Service Delivery	26
<b>III. Local Level Structural Innovations</b>	29
A. The Ward Model	29
B. Local Administrative Arrangements	30
<b>IV. Local Level Procedural Innovations</b>	33
A. Aware of Consumer Needs	34
B. Collection Efforts	35
C. Role of Enforcement	37
<b>V. Local Level Managerial Innovations</b>	39
A. Allegiance to the Monitoring Community	39
B. Incentives Based on Indicators	41
C. Flexibility Coupled with Routine	43
D. Centrally Reinforced Job Standards	45
E. A Unique Vietnamese Environment?	47
<b>VI. Strategic Technical Innovation</b>	49
A. Managing Existing Resources Efficiently	49
B. Enforcing Technical Standards within the Ward	50
<b>VII. Transitional Innovations: Implementation Strategy</b>	53
A. Scaling-Out to Similar Areas	53

B. Feedback Learning for Future Improvements _____	54
<b>VIII. Broader Implications: Institutional Lessons from HPWSCo Innovations</b> ____	<b>57</b>
A. Service Delivery Decentralization _____	58
B. Small Scale Infrastructure Improvements _____	60
<b>References</b> _____	<b>63</b>
<b>Appendix I: Map of Haiphong Showing Scaling-Out of Ward Improvements</b> _____	<b>69</b>
<b>Appendix II: The Ward Model: Key to Reducing Ward Non- Revenue Water</b> _____	<b>71</b>

## Abbreviations and Definitions

HPPC	Haiphong People’s Committee
HPWSCo	Haiphong Water Supply Company
m <sup>3</sup>	Cubic meter, (1000 liters)
MOC	Vietnam Ministry of Construction
SOE	State Owned Enterprise
TUPWS	Transportation and Urban Public Works Service
VND	Vietnamese Dong, (Exchange used for this paper VND12,000=\$1)

### *Ward*

A geographic unit, (*phuong* in Vietnamese) with 1,500 to 3,000 households, the lowest unit of municipal or provincial government administered by a ward level People’s Committee. International donors also translate *phuong* as “block.”

### Haiphong People’s Council

The legislative arm of national government power at the municipal level, elected by the Communist Party’s Fatherland and Motherland Front, and under the Council of Ministers.

### HPPC

The executive and administrative agency for the city, elected by the Haiphong People’s Council, approved by the Prime Minister.

### TUPWS

The principal city organization concerned with public works; guides and supervises HPWSCo.

### MOC

The lead central agency in urban water supply. Sets technical norms and standards, approves technical feasibility studies and supervises their implementation.



## **I. Introduction**

### **A. Water Supply Service Delivery in Developing Countries**

In the 1970s and 1980s, international advisors on water supply infrastructure were cheerful about the prospects for improving water supply delivery to developing country urban areas. Yet, as the water supply decade concluded in 1990 these same advisors have become much gloomier, criticized and criticizing for the lack of relative increase in population served by improved water supply (WHO, 1992). Indeed, according to the World Bank, many of the water projects built in developing countries over the last 25 years have been failures (World Bank, 1992). Thus, the literature suggests that many water supply improvement projects have proved to be neither sustainable nor replicable; that water projects often fail to achieve the performance anticipated in terms of water sales, number of connections, and the proportion of costs recovered; and that widespread failures of new water supply systems, mainly from inadequate maintenance, have undercut gains (Brisco, 1988; Brookshire and Whittington, 1993). At the same time, the literature suggests that the performance of service delivery is eroded when projects are expanded beyond pilot improvements, but that institutional strengthening can help maintain performance throughout service improvement (Churchill, 1987).

Challenges in water supply service delivery in developing countries can be generically summarized. From the utility's perspective there are several common problems. First, since the average price charged for water covers less than half the cost of supplying the water, the utilities do not focus on maintenance and must rely upon government subsidy

to operate. Second, utilities and governments are reluctant to connect new customers, as water prices are too low to allow them to recover their costs for these new connections. Third, huge sums of utility revenue are often foregone, as large amounts of water are lost through leaking pipes, illegal connections and other means (as non-revenue water). Fourth, many consumers who are connected do not have working meters and thus have no incentive to conserve water. Fifth, organizational inefficiency leads to inadequate water utility bill collection. Given these challenges, it is difficult for utilities to earn enough revenue to operate effectively.

In turn, a significant number of the urban populations in developing countries do not have access to satisfactory water supplies. Few are connected to the water supply network. Those without connections must spend hours gathering water from public standpipes, and/or must purchase vended water at prices on average 12 times the cost of the water utility tariff. Those with a connection often have access to water at low pressure and of poor quality for few hours per day, as poor treatment system maintenance and leaky pipes allow sewage and other contaminants to infiltrate the water supply. Rising incomes and higher user charges increase consumers' expectations for better service levels. These consumers are unwilling to pay for such poor service, contributing to the utility's financial difficulties noted above.

As developing countries try to ameliorate their water supply challenges, a central problem is the priority placed on capital intensive water supply service delivery improvement projects which build infrastructure 'monuments' while neglecting

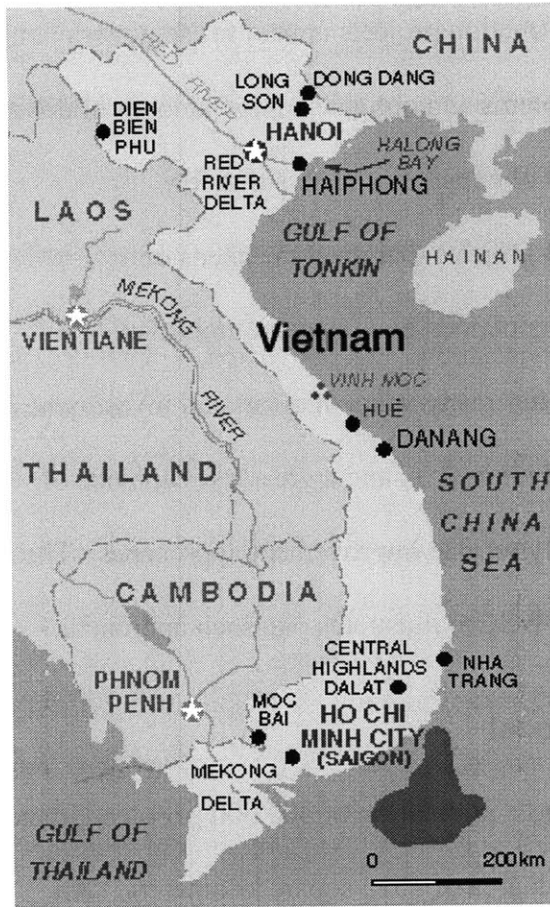
maintenance and improvement of existing resources (Brookshire and Whittington, 1993). These projects continue to receive higher priority in many water supply improvement projects, in terms of budgets and staffing (Moore, 1996; “Lessons,” no date available). Often, this is because these infrastructure construction projects appear to the government and the public to be solving infrastructure problems and obligate a large amount of donor resources (Thirkildsen, 1988). Thus, a review of experience shows that few municipalities have water supply improvement projects that meet the needs of a significant fraction of the population and are maintained once they are improved (Churchill, 1987). This disappointing record, after many years of effort and investment, has been discouraging but has led to a renewed interest in, and a greater acceptance of, the need for developing alternative water supply service improvement approaches. The case of Haiphong Water Supply Company (HPWSCo) illustrates one such approach.

## **B. Haiphong, Vietnam and the Ward Model**

Urban Haiphong is 21 square kilometers and has a population of 400,000 people. Greater Haiphong has a population of 1.3 million and an area of 1515 square kilometers. An overwhelming majority of Haiphong’s residents are ethnic Vietnamese. They have been under communist rule for generations, living within the local administrative hierarchy of ward, district, and province. The French took possession of Haiphong in 1874, and much of the city’s water infrastructure was built by the French at the turn of the century, including a steel water tower in the center of the city reportedly designed by Eiffel. Haiphong’s urban area and port were heavily damaged by American air and navel attacks during the Vietnam war in the late 1960s. Historically, Chinese refugees fished and

traded in the city, but most of these residents left in the 1970s and 80s when conflicts between the two governments made their presence in Haiphong unwelcome.

### Map of Vietnam



Haiphong is northern Vietnam's main industrial center and one of the country's most important seaports. Average per capita monthly income is 335,485 VND (\$27.96). The city describes itself as "one of the creative and active cities in the socialist construction and in the defense of the socialist country." The people in Haiphong are "sparing no effort to build it both into a modern port city with developed industry and agriculture and a center of import and export, tourism and an iron fortress against foreign invasion."<sup>1</sup>

The smallest local unit of socialist government in Haiphong is the ward, administered by the regulatory Ward People's Committee and the rule enforcing ward police. This ward authority, where transactions such as birth and death registry, profit tax collection (for commercial entities and shopping markets), and bill payment take place, is respected by ward citizens, who depend upon it for assistance. There are 1,500 to 3,000 households in an urban ward, with an average of five people living together in a household. Haiphong wards typically have a mix of households, commercial, service, industrial and manufacturing establishments.

It is within this ward administration that HPWSCo initiated its ward model reform, transforming itself into a successful service delivery provider and business from the perspective of HPWSCo as well as Haiphong consumers. Chapter Two further defines this success. Beginning in 1993, inspired by the crisis of public outcry against poor service delivery, HPWSCo piloted its '**ward model**,' completely improving water supply service delivery in one ward by establishing an office of 5-7 employees embedded within the ward administration to serve water supply customers, improving all distribution, branch and household pipework in the ward, metering 100% of the wards' consumers, and enacting a reliable monthly billing and collection system. I conclude that this model illustrates the value of strong local units delivering decentralized service and the value of implementing an infrastructure project in small-scale units.

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<sup>1</sup> Personal communication, Vice Chairman Mr. Nguyen Van Thuan, HPPC, July 15, 1998

### **C. Case Background**

HPWSCo's success should be understood in the context of changes exogenous to HPWSCo. Vietnam's *Doi Moi* (reconstruction) policy environment encourages the countries' transition toward a market economy. In the early 1990s, the Vietnamese government began pressuring state owned enterprises (SOE) that had potential to earn revenue, including HPWSCo, to become more commercially oriented. The government suggested raising revenue through user charges, making user charges palatable by providing improved levels of service, and becoming more concerned about efficiency and financial returns in management practices (Dollar, 1997). This policy change was enacted as the Central Government cut its subsidies to these SOEs. *Doi Moi* brought a decade of economic reforms during which Vietnam experienced vigorous growth, some macro-economic stabilization and a drastic reduction in poverty of 35%. Average GDP growth was 8.2% between 1991 and 1995 ("Vietnam Urban Strategy Note," 1998).

The *Doi Moi* transition to a market economy in Vietnam gave rise to challenging water sector concerns. Due in part to the past isolation of the Vietnamese economy, water supply infrastructure was affected by extreme resource constraints; by lack of access to quality materials; by the socio-political necessity for state enterprises to spread resources thinly in providing basic services free or for minimal fee to as many as possible; and by the acceptance of minimal service standards by consumers during times of national adversity.

A second exogenous variable to HPWSCo reforms is the city government. Haiphong is marketing itself as a reformed, business oriented city, providing a framework and catalyst for service delivery improvement. The city is part of Vietnam's Northern Growth Triangle and has had considerable success in attracting foreign investors by responding to their grievances and reducing some of the bureaucratic hurdles of doing business in Vietnam (Goldstone, 1998). In late 1997, the Prime Minister approved a plan for socio-economic development in Haiphong and the surrounding areas aimed at developing a zone with the fastest economic growth rate in the country (Ascher and Rondinelli, 1997).

Third, Haiphong's citizens were ready for change. Although Vietnam's growth has slowed, it has been instrumental to Haiphong's on-going development and helped to turn HPWSCo from a supply- to a demand-driven organization, as household, commercial and industrial customers began to demand better service and had more money to pay for improved service delivery. Chapter Two will describe how these demands lead to community protests with crisis consequences for Haiphong and HPWSCo. Thus, with the transition to a market economy, water supply sector policies, strategy, structure and organization need to be compatible with an environment changing from a supply to a demand orientation. Significantly, utility management needs to be reoriented: to providing water and sanitation services as a business rather than exclusively as a social obligation; to the gradual replacement of subsidies by user charges; and to the increased ability of utilities to make rational business decisions without unnecessary political control. Given these three exogenous pressures encouraging HPWSCo reform, I focus

this thesis on a fourth element of HPWSCo's changes, that of the local and overall innovations that lead to institutional transformation of the utility itself.

#### **D. Research Questions**

With these elements of Haiphong's development context and HPWSCo's reform as a backdrop, and given the emphasis in the literature on the difficulties associated with developing country water supply service delivery improvements, I explore how and under what conditions HPWSCo has transformed itself from a poorly performing utility to a successful one. Elements of *why* HPWSCo transformed itself the way it did (e.g. the compelling vision of an energetic leader and a planned response to crisis) are addressed briefly in Chapter Six and more fully explored in a case I prepared for the World Bank on the subject, (Coffee, August, 1998).

My overarching research question is how has HPWSCo achieved success through the ward model and what are the characteristics of this model that underpin HPWSCo's success. I categorize my findings into five areas. I examine the structure of the local ward water supply sub offices and ask how this structure has improved utility performance. I explore HPWSCo's procedural innovations and ask if this local level office is more responsive to consumer needs and thus increases their willingness to pay for water supply. I delve into HPWSCo's local level managerial innovations and ask what it is about the ward model that creates effective employee performance. Moving from the local level innovations, I examine HPWSCo's overall innovations, including its strategic technical innovation, using existing resources and its transitional innovation, asking how HPWSCo has gradually implemented changes, learning from ward to ward. Through



these questions, I attempt to show that HPWSCo is building a much more efficient and effective utility than would otherwise be the case.

## **E. Research Methodology**

I attempt to answer the above questions with information gathered through the following field methodology. Working in HPWSCo headquarters over a three-month period in summer 1998, I consulted with HPWSCo's director and senior staff on administrative reform as part of the World Bank Water Supply Project. During this period, I explored what was instrumental to Haiphong's improved water supply service delivery through in-person discussions with staff and donor consultants. In addition, while living in Haiphong and working on other projects with the Haiphong Sanitation Company; the Department of Science, Technology and Environment; and the Haiphong People's Committee, I interviewed ward-level HPWSCo employees as well as consumers, and discussed HPWSCo reforms with Haiphong and Central government officials. In total, I interviewed over 35 people one-on-one and observed HPWSCo from headquarters, as an inhabitant of Haiphong, and through the impressions of other city agencies and central and municipal government officials. (The Reference section provides an illustrative list of interviewees.) I performed a secondary review of data I gathered from donors, HPWSCo and the Vietnamese government.

## **F. Thesis Organization**

In the rest of this thesis, I explore elements of HPWSCo changes that I find most striking and that other reforming utilities in Vietnam and other developing countries might replicate. Chapter II provides a historical description of HPWSCo's operations and

presents indicators that show HPWSCo has been successful improving service delivery to the consumer and improving its profitability. Chapters III through VII describe five types of innovations in HPWSCo that make this story unique. The first three innovations occur at the local level, the second two occur throughout HPWSCo's operations. Together, these five innovations provide an analysis of HPWSCo's institutional change. Specifically, Chapter III describes HPWSCo's structural innovations, focusing on the complete ward improvements in one ward integrated with existing local administration. Chapter IV describes HPWSCo's procedural innovations with this structure that more directly serves the community, increasing the community's willingness to pay for improved service delivery. Chapter V describes ward level managerial innovations, stimulating employees to perform their jobs well. Chapter VI moves beyond these ward level innovations to HPWSCo's overall technical innovation, managing existing resources, rather than emphasizing expansion. Chapter VII describes HPWSCo's implementation strategy, learning from ward to ward as improvements were scaled out to adjacent wards. The changes in HPWSCo as an organization are what weave all of these innovations together. Chapter VIII addresses broader policy implications of these innovations for organizational change.

## **II. Haiphong's Previous Water Supply and Indicators of its Transformation**

Pre-innovations, Haiphong's water supply suffered from many of the problems of water supply service delivery in developing countries laid out in Chapter I. Indicators demonstrate that the utility has made dramatic improvements in a variety of areas, quantitatively defining HPWSCo's success from the perspective of the utility and from the perspective of the consumer.

HPWSCo is an SOE of the central government's Ministry of Construction. The company reports to HPPC through the Transportation and Public Works Service (TUPWS). (Prior to 1993, it reported to HPPC's Construction Service.) An HPPC steering committee for HPWSCo has oversight over the company. With these institutional relationships, HPWSCo does not have autonomy to make decisions and set policy on the following: tariffs and revenues; investments; technical and financial decisions involving major renovations; manpower and recruitment; level of compensation and salary rules; primary policy issues; and construction works. These decisions and policies are made by HPPC and its Planning, Finance, and TUPWS committees, Haiphong People's Council, and other institutions such as the labor union (e.g., salary and compensation) or the Department of Transportation (e.g., construction works).

### **A. Pre-Innovation Haiphong Water Supply**

In the context of many low-income countries' utilities, including Vietnam's, Haiphong's poor quality water supply delivery was not unusual. Haiphong residents were

inconvenienced by the ills of a historically poor water supply service delivered by an inefficient utility, HPWSCo. For instance, in areas far from the head of the distribution network customers had to queue at public stand-posts for several hours to fill buckets of water, sometimes in the middle of the night when use in the city center was lower. In areas closer to the water treatment plant where water flowed from taps, but erratically and at low pressure, households invested in electric pumps to pump water from the public system or from private ground-wells to upper stories, and invested in sidewalk reservoir tanks to gather water at the lowest possible elevation as it trickled from the public system, (illustrating their willingness to pay for improved water supply). Taps to the tanks that were left on overnight in hopes of gathering intermittent water often caused the tanks to overflow.

Tariff collection and consumers' willingness to pay for low quality water supply service were also similar to the experience of utilities in other developing countries. Prior to 1993, Haiphong consumers were charged neither a water tariff nor a tariff for other public services. Between 1990 and 1993, in response to the government's pressure to commercialize, and prior to ward water supply improvement, Haiphong Water Supply Company (HPWSCo) customers were charged a nominal per capita monthly flat rate tariff 500 VND/month/capita (\$.04) paid to the ward People's Committee as part of a lump sum of other fees. Also during this time, consumers augmented whatever water they could abstract from the distribution system by purchasing water from vendors at an aggregate monthly price 25 times the flat rate water tariff.<sup>2</sup> Until Haiphong began

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<sup>2</sup> In Haiphong, vending was legal and prolific, although there are no data about the proportion of water obtained from vendors. Vendors purchased water from several water tanks operated by

reforms, including metering customers and collecting a water tariff, households with access to piped water had no incentive to conserve water, as they were not charged based upon their consumption. In addition, their willingness to pay a flat rate tariff for poor quality, intermittent and low pressure water was low, based upon the low collection rate of lump sum fees.

During a seasonal drought in the summer of 1993, Haiphong consumer dissatisfaction turned to public outcry (a rare event among northern Vietnam's committed socialist residents) over the lack of water. These protests were uncommonly aggressive in areas with extraordinarily poor water supply service delivery far from the head of the distribution network and resulted in the severe beating of two HPWSCo employees, one of whom eventually died. This crisis inspired the Haiphong People's Committee (HPPC) to make changes in HPWSCo.

In the last three months of 1993, HPWSCo pilot tested the ward model in Lam Son ward, the ward at the head of the water treatment network, An Duong water treatment plant. The utility opened a ward water supply office, rebuilt the ward distribution network and installed a ward master meter and consumer meters. HPWSCo also made the outlying Dong Quoc Binh ward, the site of the public protests, a part of the initial pilot.<sup>3,4</sup> The

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HPWSC and transported the water in HPWSCo or other utility trucks. Water was sold directly to, wards, or, especially in the areas more distant from the city-center, groups of neighbors.

<sup>3</sup> HPWSCo also recognized the concerns of the restive (poor) population living farther from the major treatment plant, as well as HPPC's desire to respond to their needs. Households in yet-to-be improved wards saw the visible gains in the Lam Son pilot ward and were aware of what they could expect in return for cooperating with subsequent water supply improvements. Still, ignoring the concerns of the poor removed from the city center could have lead to further protests, waylaying HPWSCo's plans for ward model implementation in subsequent wards. So,

ultimate goal was to quell consumer disquiet by serving more customers with reliable water, while generating revenue for future improvements, all using Haiphong's existing potable water resources.

How these changes took place is the subject of subsequent chapters. The rest of this chapter presents indicators of HPWSCo's successful reform that are attributable to the ward model. By comparing some HPWSCo indicators over four years of reform and with developing countries, this section defines what I mean by success. In the context of Haiphong water supply consumers, improved water supply means adequate pressure water provided 24 hours per day through a metered household or business connection. In the context of HPWSCo, improved water supply also includes a reduction in non-revenue water, 100% meter coverage throughout the city and eventually earning a profit. Thus, HPWSCo's reforms are successful from the perspective of improved service delivery, as well as improved utility performance. The next two sections describe these indicators of HPWSCo success, summarized in the following table.

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in addition to the ward model in Lam Son, in 1993 HPWSCo used a different approach to make *semi-improvements* in Dong Quoc Binh ward, a ward distant from the major treatment plant and city center that houses primarily poor city workers. HPWSCo installed a booster pumping station and a new distribution system from this booster station to various metered public tanks within the ward. For each public tank, a neighborhood representative was selected by the ward people's committee to sign the water use contracts with HPWSCo and to pay for water measured by tank meters. This representative, in turn, collected water tariffs from his neighbors. The utility does not expect payment from consumers receiving as-yet improved service.

<sup>4</sup> To further confirm that wards farthest from the city center would be included in improvements, HPWSCo published a schedule of ward improvements, which the utility has maintained to date. In addition, four other outlying wards have been subsequently semi-improved and are scheduled for full improvement, including having mains replaced, old-distribution network cut off, and individual consumer meters installed. Each of these semi-improved wards has adequate pressure water supplied 24 hours per day. HPWSCo is committed to complete diffusion of full ward model improvements to all Haiphong urban wards. Yet these actions further illustrated to consumers and HPPC that HPWSCo was aware of the concerns and difficulties of wards farthest

**Table 1: Selected Indicators HPWSCo's Successful Transformation<sup>5</sup>**

Indicator	1993	1997	Notes	Average US Data
<b>UTILITY</b>				
Profit(loss)	(3.1 Billion VND,) (\$258,333)	3.745 Billion VND, \$312,083		
Wards designated as improved	0% of urban wards (0)	50% of all urban wards (23)		
Metered consumers in improved wards	0%	100%		
Average per capita tariff in improved wards	850 VND/ m <sup>3</sup> (\$0.07)	1747 VND/ m <sup>3</sup> (\$0.15)		\$0.96
Revenue collected, domestic consumers	6,387,000 VND/annum	18,818,227 VND/annum		
Revenue collected, commercial consumers	995,575 VND/annum	6,844,291 VND/annum		
Revenue collected, industrial consumers	2,997,094 VND/annum	4,867,936 VND/annum		
Accounts Receivable	83 days/year	11 days/year	Data 1994 & 1996	10 days/year
Non-revenue water	85% of water supplied, estimate	22% of water supplied to improved wards		20%
Consumption, average for one improved ward (2,000 people)	8000 m <sup>3</sup> /day	1400 m <sup>3</sup> /day	Lam Son ward	
Water production from (major) An Duong water treatment plant	42,898,334 m <sup>3</sup> /year	39,123,000 m <sup>3</sup> /year		
<b>CONSUMER</b>				
Connections	28,000,	80,000		
Population with metered water supply	0% of urban population (0)	68% of urban population (297,000)	Data 1992 & 1997	100% of urban population
Average pressure	.1 bar	1.2 bar		2.0
Hours water available from existing connections, average	4 hours/day	24 hours/day		24 hours/day
Samples with no coliform	0%	92%		95%

from the head of the distribution network and had good intentions of improving the entire city's water supply.

<sup>5</sup>Source for table data: Conversations with HPWSCo; Luy, 1997; Leppanen, 1997; McIntosh, 1997, Yepes, 1996.

## **B. Improved Utility Performance**

With reforms, HPWSCo is now earning a profit. The utility is able to earn more revenue from each of its customer categories (household, commercial and industrial) in improved wards. It has so far improved 50% of Haiphong's wards, including installing meters for every connection, beginning in the ward closest to the water treatment plant and scaling out to adjacent wards.<sup>6</sup> Annex I provides a map of Haiphong's wards. Metering consumers allows HPWSCo to charge Haiphong consumers for water consumption.

HPWSCo is increasing its tariff concomitant with service improvements.<sup>7</sup> The water tariff in Haiphong has been steadily rising from nothing prior to 1990, to the monthly flat rate tariff of 500 VND/ m<sup>3</sup>/capita between 1990 and 1993, to an average tariff of 850 VND/m<sup>3</sup>/month/capita (\$0.07) in 1993 and to an average tariff of 1,747 VND/ m<sup>3</sup> /month/capita (\$0.15) in 1997 in improved wards. A household living in an improved ward has an average monthly water bill in 1997 was 19,867 VND (\$1.66). (For comparison, a household's average monthly electricity charge was 58,237 VND (Luan, 1998)). Dis-aggregating these 1997 averages: household tariffs were 1,600 VND for the

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<sup>6</sup> It costs approximately \$1 million to fully improve one ward's water supply delivery. In Haiphong this cost is covered not only by company revenues, but also by a Finish International Development Agency (FINIDA) grant for the Haiphong Water Supply and Sanitation Program and a credit from the World Bank for the Socialist Republic of Vietnam's Water Supply Project. These bi- and multi-lateral agencies provide monetary assistance for all elements of HPWSCo operations (e.g., training and technical assistance; a computerized accounts receivable system; water treatment plant improvements), not just those related to the ward model. Thus, it is difficult to calculate an exact figure for the amount of ward improvement costs born by donors. However, HPWSCo estimates that in 1997, 40% of ward improvement costs were covered by HPWSCo revenues, 30% of ward improvement costs were covered by a subsidy from HPPC, and 30% of ward improvement costs were covered by grants from the World Bank and FINIDA (Personal communication, Director Luy, 11/98)



first 4 cubic meters per capita per month increasing to 2,200 VND per cubic meter per capita per month consumed after that; industrial (manufacturing) and commercial (service) tariffs were 2,700 and 5,500 VND per cubic meter, respectively. The average household tariff is expected to increase yearly to 4,591 VND/ m<sup>3</sup> (\$0.38) in 2003.<sup>8</sup> Also, the number of days per year that accounts remain unpaid has decreased substantially, as HPWSCo has facilitated bill payment and enforced fines for non-payment.<sup>9</sup>

As wards are improved, HPWSCo further increases their revenues by decreasing the percentage of non-revenue water by replacing water mains and distribution lines and installing consumer meters.<sup>10,11</sup> Based upon the amount of water consumed per ward before and after ward improvements, wasteful water consumption has fallen. With increased consumer efficiency (due primarily to consumer metering) and decreased non-revenue water, HPWSCo can serve more consumers with less treated water, and the need for water produced from the water treatment plant subsequently decreases.

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<sup>7</sup> The average tariff is a good measure of the financial discipline of a utility and its autonomy to cover operational costs with revenues from tariffs. The average tariff is the main tool in imposing demand management on the consumer public.

<sup>8</sup> According to income data gathered in a 1998 customer service survey, wealthy households are paying 1.25% of their income per month for water supply, while the poor are paying 1.35%, on average, of their income for water supply (Luan, 1998).

<sup>9</sup> If payment is late by 10-20 days, the ward office imposes a fine of VND 200,000. Tampering with the meter is cause for disconnection, cancellation of the water contract, and a fine of VND 500,000.

<sup>10</sup> Non-revenue water (also known as unaccounted for water) is the difference between the water produced and the water sold. It is described as a percentage of water produced, in m<sup>3</sup>.

<sup>11</sup> For comparison, Hanoi's non-revenue water remained at 69% over this same period (SAR, 1997) and throughout Asia non-revenue water is 40%, on average (McIntosh, 1997).

In sum, in addition to decreasing the amount of water needed to serve Haiphong consumers, decreasing non-revenue water and collecting tariffs and fines from their non-metered customers helps HPWSCo to realize a profit.<sup>12</sup>

### **C. Improved Consumer Service Delivery**

While improving utility performance, HPWSCo has dramatically increased the number of connections to the water supply system, and thus the proportion of the urban population served with improved water has increased from 0 to 68%.<sup>13</sup> As non-revenue water has decreased and pipework has improved, water pressure has increased throughout the network. Similarly, because non-revenue water has decreased, HPWSCo is supplying water to its consumers 24 hours per day. The coliform content of the water supplied to consumers has decreased as a consequence of fewer leaky pipes, higher water pressure and constant flow (obviating vacuum conditions when contaminants enter pipeworks absent of water.)

Importantly, customer service is improving even for customers in as-yet-improved wards. As noted in the previous section on utility performance, the improved wards are using water more efficiently (using the same amount of aggregate water from the water

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<sup>12</sup> The profit figures for HPWSCo are misleading, however. Currently, as they have in the past, HPWSCo counts the charge they pay themselves for constructing new mains and distribution lines as revenue. In addition, they continue to consider the FINIDA grant as revenue. At the same time HPPC has allowed HPWSCo to retain funds that were previously paid back to them, (e.g. depreciation charges), in order to augment HPWSCo's ability to self-finance its operations. Yet, since both the construction revenue and FINIDA grant remained basically constant between 1993 and 1997 HPWSCo's change from a 3.1 billion VND (\$258,333) loss in 1993 to a 3.745 billion VND (\$312,083) profit in 1997 primarily reflects decreasing water losses and increasing connections and collections.

treatment plant to serve 68% more consumers with improved water) and non-revenue water is significantly reduced. Thus, consumers in unimproved wards are served (at their public standpipe or individual connection) with increasingly higher-pressure water for more hours per day as more wards are improved.

The above quantitative indicators have improved consumers' satisfaction with HPWSCo. Before 1993 ubiquitous articles in the state-run city newspapers, responding to consumer complaints they received about HPWSCo, pointedly commented on the poor quality of the city's water supply service delivery. Now, however, the newspapers routinely publish public water supply service announcements and plans for future work in as-yet improved wards, rather than criticisms of HPWSCo performance. This indicates increased consumer approval of on-going reforms, as well as state support for HPWSCo. Consumers in improved wards direct their complaints directly to HPWSCo ward water supply employees, rather than to the newspaper. HPWSCo records of received complaints and requests show complaints about water quality and requests for repair work decreased five-fold since 1993. In turn, as HPWSCo enforces bill and fine collection, consumer complaints regarding HPWSCo fines have increased by 10% (Thu, 1998).

Further indications of consumers' satisfaction might be related to a significant decrease in days accounts receivable, as formerly indifferent consumers now pay their bills for their improved service on time, as well as a significant decrease in illegal connections to the

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<sup>13</sup> An additional thirteen wards will be improved with the assistance of a World Bank loan through 2002, and the remaining ten wards furthest from the distribution network will be

existing network. In a 1998 study of non-revenue water, no illegal connections were found in a comprehensive inspection of two improved wards (HPWSSP, 1998). While this indicates that ward water supply employees are effectively monitoring the installation of the water distribution network, consumers point out that they are being serviced in a timely and fair fashion, and thus do not need to resort to abstracting water illegally.

The above indicators show that HPWSSCo reforms are successful from the perspective of utility and consumer and set the stage for answering the sub-questions of my thesis, as described in Chapter I: What are the structural and procedural innovations at the local level that improve HPWSSCo and more directly serve the Haiphong community? What are managerial innovations that encourage good local staff performance? What is the technical approach that improves HPWSSCo? How does HPWSSCo use what it learns from one improved ward in its transition to the next to-be improved ward? Answering these questions will describe how HPWSSCo achieved the above indicators. First, the next chapter describes in more detail the innovative structure of HPWSSCo's institutional change, the ward model.

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improved by 2005.

### **III. Local Level Structural Innovations**

Local level activity is noted in the literature as a solution to typical service delivery problems, since local offices both ensure that consumers are satisfied through direct attention to consumer needs and ensure more efficient utility performance through more immediate maintenance (Rondinelli, 1988). Similarly, HPWSCo was able to reform from a poorly performing utility through a locally based model. Ultimately, HPWSCo's ongoing success is predicated on the structure of the water supply service delivery ward model. This chapter describes this structure, as well as the ward model's fit with other offices of the ward administration

#### **A. The Ward Model**

The ward model of water supply service improvement begins with the creation of local HPWSCo consumer service sub-office in each ward, staffed with five to seven members of the community, including a manager, two water meter readers, two bill collectors and a technician for minor repairs of pipes and meters. A bulletin outside of the ward People's Committee or the ward water office prominently displays ward water supply staff and consumer responsibilities. A master meter is installed at the connection point between trunk mains and ward distribution lines. This master meter makes it easier to locate sources of non-revenue water and establishes a point of reference for ward billing of household meters. HPWSCo ward offices connect all customers within their ward to these distribution lines through branch connections, installing a meter on every connection and signing a customer contract that details HPWSCo and consumer rights

and responsibilities. At the same time, old branch and distribution pipelines are removed or disconnected from trunk mains.

The customer pays for the branch connection and meter, and the total cost to each household ranges from 350,000-700,000 VND (\$30-\$60), depending on the length of the house branch pipeline. Consumers may pay this fixed cost on an installment plan with nominal interest over the course of a year. *Once their meter is installed*, consumers pay a metered tariff, which, in 1997, was 1,600 VND (\$0.13) for the first 4 cubic meters per capita per month, increasing to 2,200 VND (\$0.18) per cubic meter per capita consumed after that. The industrial/manufacturing and commercial/service tariffs in 1997 were 2,700 (\$0.23) and 5,500 VND (\$0.49) per cubic meter, respectively. The entire ward water supply improvement process takes about three months per ward.

## **B. Local Administrative Arrangements**

To some extent the ward model works well because the ward water supply sub-office is physically located in the same complex that houses the ward police and the ward people's committee office. This proximity confers upon the sub-office a level of respect it might otherwise not receive, or not receive immediately. In other words, ward water supply offices are further embedded in a visible position in the respected, authority-commanding ward administrative apparatus. However, their office is not a physical part of these offices. This distinction is important because, while individuals can be wary of the regulatory ward People's Committee and rule-enforcing police office, HPWSCo ward offices support delivery of a public service, and their regulatory role is minimal to non-

existent. The ward water office, positioned within this local administrative structure, is well located to serve consumers, as discussed in the next chapter.





#### **IV. Local Level Procedural Innovations**

By creating ward water supply offices, HPWSCo is better able to serve its consumers, thus increasing their willingness to pay for water supply service delivery. This chapter explores the procedural innovations that make the ward model responsive to consumers' needs, linking this responsiveness, as do other cases of service delivery decentralization described in the literature, to increased consumer willingness to pay.

HPWSCo's experience supports the positive link between decentralization and improved service delivery. Infrastructure advisors increasingly understand that service provision linked to local communities is crucial to successful infrastructure service delivery improvements (Fox, 1994). For instance, Tandler and Freedheim (1994) found that local governments in Northeastern Brazil are better than central governments at outreach and that local governments are more immediately responsive to users of public services. However, in other cases, while this transfer to the local level increases a government's ability to reach large numbers, at the same time it can increase inequitable distribution of public goods and services and place pressure on local government resources (Dillinger, 1994). In the case of HPWSCo, wards are improved based upon their proximity to the water treatment plant and every resident in an improved ward is connected to a metered connection and expected to pay the same per capita volumetric tariff, and resources are evenly and incrementally distributed throughout Haiphong's wards. Most importantly, decentralized service delivery allows HPWSCo to better serve its consumer's needs.

## **A. Aware of Consumer Needs**

Typically urban utilities have difficulty receiving and addressing customers' feedback, since they are removed from the customer in a headquarter office. In general, these utilities respond in a generic way to community complaints, often only after they have had the time and managerial energy to mobilize their central administrative apparatus. In contrast, HPWSCo's ward employees provide immediate communication between utility and consumer, offering daily face-to-face interaction and facilitating flexible and appropriate responses to consumer needs. In addition, maintenance, which is so important for both customer satisfaction and overall utility performance, is more quickly enacted, at the ward level with a case-specific solution. For instance, a consumer needing to have his meter repaired can simply mention his requirement to the ward water staff by stopping at the ward water office on the customer's way to work or by hailing a ward water employee during the employee's frequent travels through the ward to read meters, bill and collect tariffs, as well as check for visible leaks. The ward water employee can work to fix the meter herself or report it immediately to the service department in HPWSCo headquarters. Similarly, ward water employees can directly distribute and explain the requisite consumer/utility water contract, as well as literature on water conservation and public hygiene, reaching populations (based on relative proximity and untraditional work hours) that might otherwise not receive or focus on these community service messages. Thus in general, through their daily interaction with consumers, ward water employees confirm HPWSCo's commitment to improved service, troubleshoot and provide smooth interaction between the government utility and the community.

Working within the ward People's Committee compound, the ward water employees are privy to the ward People's Committee's information on residents, and are familiar with characteristics of the households in their ward. For example, they are able to monitor demographic information important for the per capita tariff, such as number of households and number of individuals per household. In addition, they can tailor their service provision to the individual characteristics of consumers, for instance collecting water tariffs during the lunch hour, in the evening or on Sunday from consumers unavailable to receive the ward employees during the day. In another instance, this insider information makes ward water supply employees aware of mis-identified consumers (e.g. commercial operators self-registered as household consumers), suspiciously low monthly water usage, and potential illegal connections. Based on household and ward characteristics, a ward water supply sub-office can strategize with the ward police office about how to manage consumers who continually fail to pay their water bill or illegally register as a household consumer. Although there is a potential for graft in this proximity, Chapter Five notes the incentives that discourage this.

## **B. Collection Efforts**

The experience of other utilities demonstrates that measuring consumer water usage, collecting user charges and sanctioning lack of payment are the most effective mechanisms to recover costs and increase consumption efficiency in municipal water service. Ward offices reliably collect water bills and imposes fines for late-payment or illegal usage without police assistance. Ward water supply employees frequently visit consumers late to pay their bills, and the ward police station is engaged in cases of on-going failure to pay. HPWSCo pays ward police stations a nominal 50,000 VND/month

(\$4.17) for their support of the ward water offices' operations, including assisting with monthly bill or fee collection in situations where consumers continue to refuse to pay their water tariff. HPWSCo's policy is to threaten to disconnect consumers, and cancel their water contract, if they are more than 20 days late in paying their water bill.<sup>14</sup> This threat, (coupled with consumers' willingness to pay for improved service delivery), has dramatically decreased days per year that HPWSCo has accounts outstanding. Overall, these actions provide an economic incentive to consumers, constraining their water wastage and encouraging their payment for service, so that utilities may operate and maintain themselves effectively (Altaf, 1993; Rogers, 1996). Yet ultimately, consumers pay for their water supply service delivery because it is serving their needs well.

Anecdotal evidence suggests that Haiphong consumers are paying their water tariff in response to improved service. In one-on-one interviews (that is, without ward water supply employees in attendance) with Haiphong consumers, consumers consistently linked their water tariff payment and their increased water pressure, increased water quality and the increased hours per day they could rely upon water. In particular, households commented upon the large burden of standing in a queue for up to several hours to collect water late at night that was lifted by the installation of household connections. "I am essentially paying for a full night's rest," one resident said. In fact, individuals noted in interviews that they wished that the sanitation and drainage

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<sup>14</sup> Using threats to ensure that customers pay their utility bills is not uncommon in Haiphong. For comparison, in 1993 the Haiphong Electricity Department, whose tariff is collected through the ward People's Committee, threatened to shut down electricity to areas with low bill payment in an effort to reduce the company's non-revenue electricity. In the first six months of the year, unaccounted for electricity decreased from 95% to 30% in some wards (Thu, 1994). Both HPWSCo and the electric utility have followed through on their threats.

department would begin to charge and collect a tariff for sewerage service so that its delivery too would be improved. This anecdotal evidence is particularly striking in light of the fact that Vietnamese consumers can be wary of change and reluctant to pay for water, a resource their beloved leader Ho Chi Minh had declared “free to all” as late as the 1970s.

### **C. Role of Enforcement**

One might assume that consumers pay their water bills not because they are willing to do so, but because they are intimidated by the authority of the ward police and the Ward People’s Committee and threatened by these agencies as well as ward water employees seeking payment for fines. Indeed, with no HPWSCo track record of success, the ward administrative structure played a relatively significant role in convincing consumers to cooperate in Lam Son pilot ward. HPWSCo was challenged to convince consumers that their water supply would be high pressure, reliable, high quality and well-maintained. While Haiphong residents were hopeful that HPPC’s changes to HPWSCo would improve their water supply, it was difficult to get consumers in Lam Son ward to agree to construction of the improved water supply system, especially the installation of household water meters, because consumers were unfamiliar with paying for services based upon consumption volume. HPWSCo relied upon assistance from the existing ward administrative structure to carry through improvements in the pilot ward. HPPC assisted HPWSCo in seeking the support of ward authorities for water supply improvement; persuading consumers to join the new network and pay their meter installation fee; and making logistical arrangements for construction of the network. The ward police office oversaw pipeline installation and advised households to cooperate with

branch pipe construction and meter installation. The proximity and operational connection to these ward-level rule-enforcing and administrative agencies assisted the ward model in its pilot phase and throughout its diffusion to subsequent wards.

Thus, the police play an important role in assisting HPWSCo ward offices with non-compliant consumers and initial ward improvements. However, it is HPWSCo's service delivery improvements and ward level efforts to raise awareness about the market link between payment and improved water service that have increased consumer willingness to pay.

While this chapter has described the community as consumer, the next describes the important role this community plays in ward water supply employee work effectiveness. Employee work effectiveness is magnified by a variety of ward level managerial innovations that compel local staff to perform well, contributing to HPWSCo's success.

## **V. Local Level Managerial Innovations**

Field offices far from the eye of headquarters' direct rule can be less productive and less reliable than central offices, burdening agencies with their poor performance. Yet, in the case of HPWSCo, creating ward-level offices that implemented all consumer-oriented operations was crucial to the company's on-going service delivery. HPWSCo is not unique in relying upon field offices to improve its performance. For instance, in a study of eleven Asian development organizations, Jain (1994) found that the most successful development organizations design their operating procedures such that they minimize headquarters-based work and necessitate the presence of field staff. HPWSCo's local ward water supply offices are successful in part because of the exemplary performance of their employees. This chapter explores what leads to this productive and reliable local employee performance.

### **A. Allegiance to the Monitoring Community**

One reason HPWSCo ward employees perform their duties well is that they are hired from the areas in which they live (as required by HPWSCo's Personnel Department), so they are compelled to do well by their relationship with their neighbors, who are monitoring their work in the ward.<sup>15</sup> By creating ward water supply offices staffed with members of the ward community, HPWSCo places employees in a visible position in their own communities. This situation means that the community monitors ward water supply staff, and, conversely, these ward workers are recognized and honored by ward

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<sup>15</sup> Local hiring is also practiced in the Ward People's Committee office and ward police office, both of which are staffed with people from the local community. It tends to follow a national

citizens, setting up a comparative relationship of community as monitor of, versus advocate for, ward water supply staff. The ward water staff know that HPWSCo consumers who are also their neighbors, are watchful for wrongdoing (especially as consumers previously received water for free). Therefore, the ward water staff feel compelled to perform well. On the other hand, the ward water staff comment on the respect they receive from their neighbors for improving water supply service delivery; therefore the staff are supported in their efforts to perform well by the recognition they receive from consumers.

This paradoxical relationship between ally and monitor, consumer and local staff, is noted in the literature as contributing to increasing local staff accomplishment. For instance, Tandler and Freedheim (1994) and Tandler (1997) discovered that health workers in northeast Brazil worked more effectively because these workers were embedded in communities where they worked. The employees felt increased job responsibility because they were both bound by trust to the community and at the same time monitored by them. Similarly, Taiwanese community irrigation patrollers described by Lam (1996), and the Korean community irrigation patrollers described by Wade (1994), are embedded in a larger structure of their community's personal relations and social networks. This means that any actions on their part that cause harm to one or more individuals in the local community put them under significant social scrutiny.

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pattern as well, where, for instance, state owned enterprise staff are often given projects in their ancestral villages.



Ward water supply employees have allegiance to HPWSCo for several other reasons. For instance, many HPWSCo ward employees have relatives working in headquarters, following the tendency of Vietnamese state owned enterprises to hire children of employees “to create a more familial environment in daily work.” This family network pressures ward employees to perform well. Finally, ward water employees, as with most Vietnamese working for the state, tend to keep their jobs and residences for a long time, and thus they have a vested interest in maintaining good community relationships to sustain the quality of their work life.

By drawing staff from the local area where they, their kin, and their neighbors have repeated exchange over long periods of time, one might assume that the ward model encourages clientilistic behavior: Ward water employees could collude with water consumers to seek only a percentage of the consumer’s full water bill and subsequently keep a percentage of what the customer does pay for themselves. The literature reports on this sort of collusion calling it “cozy corruption” (Wade, 1994, p. 54) between agency and client, devoted to maximizing the rental income of the local staff and minimizing the cost to users. Yet, in the case of HPWSCo, this cozy corruption does not take place, and this is primarily attributable to HPWSCo’s ward employee incentive system.

## **B. Incentives Based on Indicators**

Ward level staff have salary enticements to work up to HPWSCo expectations. By linking accurate water bill collection to ward staff salaries, HPWSCo prohibits local level opportunistic behavior. Each ward water supply sub office is responsible to HPWSCo headquarters for producing 98% of the consumers’ monthly water tariff revenues based

on the amount of water registered by the ward's master meter, as well as the previous month's water bill arrears. Ward office employees receive a fine or bonus depending on their achievement of this indicator. This incentive system confirms other cases highlighted in the literature, which note that, where field staff work at a great physical distance from headquarters, alternative methods, including salary incentives connected to indicators to the traditional hierarchical model of ensuring staff compliance to standards, are required (Wade, 1994; Moore, 1992).

Performance-based incentives are part of HPWSCo's overall corporate structure.<sup>16</sup> For instance, bonuses are paid for achieving certain HPPC-set financial targets, (e.g. 19% of total annual revenue is set aside and divided into three components: 50% for company development, 30% for staff salary bonuses, and 20% for a welfare fund), thus staff income levels are affected by company performance. Similar to ward employees' performance incentives, water treatment plant employees receive rewards or fines for energy efficiency (especially relevant now that electricity is no longer subsidized), chemical conservation and the quality of treated water, among other productivity indicators.

The value of these enticements, in particular in improving HPWSCo's bill collection, is sharply illustrated when contrasted with failed earlier efforts to collect water tariffs at the ward level. For instance, prior to 1993 ward People's Committee offices (also staffed with locals) had collected HPWSCo flat-rate water tariffs, yet their bill collection rate

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<sup>16</sup> As with other socialist firms, HPWSCo employees all share in the residual enterprise revenue, based on a fraction set yearly by the central government.

was under 30%. Also prior to 1993, in an experiment in Thoung Ly ward, the well respected, locally based Communist Party's Youth Union was given responsibility for tariff collection, but they were given no institutional support from the ward administration and no percentage of collected revenues. Thus their bill collection rate was less than 5% of the cost of the water sold in 1991 (Thu 1994). Given this poor ward-based experience, it is important to consider other factors that might account for the ward model's operational success.

### **C. Flexibility Coupled with Routine**

Local employee performance results not only from their allegiance to their community and the salary incentives they receive for performing well, but also from the varied, discretionary tasks implicit in their consumer-responsive jobs. While it is true that job standards and job variation are not mutually exclusive, the example of HPWSCo is interesting in that it suggests increased ward water employee motivation and job satisfaction stemming from their varied and responsive tasks coupled with routine.<sup>17</sup> Prior

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<sup>17</sup> The following is an illustrative list of ward HPWSCo staff duties, not all of which are explicit in the employee contract:

- Receive applications for water use contracts;
- Manage distribution pipelines from ward master meter to individual consumers;
- Receive complaints;
- Repair leaking and broken pipes and minor meter faults;
- Read water meters;
- Monitor and update consumption figures: (number of households; number of people; household, commercial or industrial water use);
- Collect water tariff ;
- Maintain direct contact with the ward People's Committee and police station;
- Rectify water use violations and disconnect illegal connections;
- Educate and raise consumer awareness about water conservation;
- Encourage community participation in distribution management, reduction of non-revenue water, and decreasing water wastage;
- Sign water supply HPWSCo/consumer contracts, receive connection applications;
- Report to HPWSCo's Consumer Services Office;
- Prepare customers for changes in billing (e.g., tariff increases);

to HPWSCo's reform in 1993, there were no ward water staff, and HPWSCo headquarters' staff interacted with consumers relatively rarely, only during business hours, and according to a carefully set protocol. With the implementation of the ward model, however, HPWSCo ward employees, responding to consumers needs, have extremely wide-ranging tasks that they can carry out under relatively more flexible schedules (*e.g.*, household meter reading, billing and bill collection after business hours when working consumers are more likely to be home). In one-on-one interviews, several ward water employees responded to questions about this flexibility, saying that they appreciated being able to carry out some of their responsibilities at odd hours as this flexibility allowed them to share childcare responsibilities with their working spouse. In addition, since less than 10% of ward water employees have university degrees (Thu, 1998), a ward office can provide a worker with little formal education beyond high school an opportunity to be challenged and excel in a variety of tasks. A survey of HPWSCo employee's noted that ward water employees, relative to other HPWSCo and other state-owned enterprise employees "had a higher than normal interest in their jobs." In support of this finding, American worker productivity literature accepts that variation and discretion in worker tasks contributes to worker productivity through increasing their motivation. Indeed, other literature notes that this discretion promotes workers' self-regard, their commitment and their ultimate performance (Lipsky, 1980; Tandler and Freedheim, 1994).

To balance this flexibility of ward water supply employee's varied tasks, the framework of a monthly routine increases ward water employee's application to their

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Monitor pipeline construction.

responsibilities. In HPWSCo's case, the billing cycle provides an important schedule for ward employee responsibilities, breaking the month into the fundamental tasks of meter reading, billing, and tariff collection. Thus, whereas local situations and problem cases require varying responses, these wide-ranging responses are coupled with the routine of the billing cycle. Depending on the size of the ward, ward water offices agree upon a notional schedule for each of these routine tasks, breaking the ward into smaller units for which each employee has billing-cycle responsibility.

#### **D. Centrally Reinforced Job Standards**

Especially given the extremely varied tasks required of ward employees responding to individual consumer needs, it is important that these employees have an activity frame within which to work. HPWSCo further defines its expectations of ward employees through clear definitions of standardized ward water employee responsibilities. These task definitions are described in each employee's contract with the Party Labor Union General Secretary and with HPWSCo, as is typical of Vietnamese state owned enterprise employee protocol. Also, the water contract signed between HPWSCo and each consumer defines ward level (as well as consumer and overall HPWSCo) obligations. Finally, a billboard prominently displayed outside of each ward water office details the consumer and ward water office code of responsibilities. These measures lessen ambiguity and multiplicity of objectives by clarifying staff goals. However, as Lipsky (1980) describes in his study of American "street level bureaucrats," it is still difficult to achieve direct agency accountability from employees working far from headquarters. These employees exercise high degrees of discretion, at least where qualitative aspects of their work are involved, that, as noted earlier, contribute to higher levels of consumer and

staff satisfaction. Yet egregious examples of ward water employee indiscretion are neither currently on record with HPWSCo headquarters, nor a part of the informal chronicle of HPWSCo's five-year history of implementation of the ward model.

In addition to the accountability described in previous sections of this chapter, perhaps another reason this discretion has not been abused by HPWSCo ward water employees is that these employees are nested within the broader ward and HPWSCo institutional setting and are accountable to HPWSCo management. To reinforce job standards, the ward administrative apparatus maintains a close connection with ward water staff through monthly ward People's Committee meetings, attended by ward community leaders, at which attendees report on community water supply service delivery needs and provide feedback on utility performance. Subsequently, HPWSCo's Director and Customer Service Office meet monthly with individual ward offices, inviting them to HPWSCo to check progress against ward-specific water bill collection and non-revenue water indicators, to distribute the bonus (or collect fines) for greater than 98% consumer water bill collection, to trouble shoot and to discuss tactics for further increasing operational performance. These meetings maintain a connection between the ward and HPWSCo's headquarters, confirming regular job responsibilities. Indeed, the literature suggests this connection with the center may be crucial to the success of programs decentralized to local offices (Tendler, 1997) and supervision of progress and crosschecks of indicators of local employees' performance can be of primary importance to agency success (Jain, 1994).

## **E. A Unique Vietnamese Environment?**

Although the discussion in this chapter attributes exemplary ward water supply employee performance to managerial innovations, elements of Vietnam's administrative structure, which is traditionally Socialist, might impact their performance as well. Ward staff could be compelled to perform their jobs well because of the strict social mores of a Socialist system, or the potential negative ramifications of poor quality work from the ward police and People's Committee authorities. Yet, it is a common quiet joke about the typical Vietnamese state employee that their days revolve around the two-hour-plus lunch break—implying that strict rules are not an element of many state-employees' individual work ethic. Typically, employees in state-owned enterprises are not driven to efficiency by strict social mores, but rather are unmotivated due to poor morale (World Bank, 1996). It is noteworthy that, of a dozen ward employees with whom I spoke, none mentioned police intimidation as a motivation for their work, and I observed a collegial comradery between ward police and ward water supply employees. Therefore, the explanations presented in earlier sections of the paper are more credible reasons for ward staff performance.

While the previous three chapters have primarily addressed changes in HPWSCo's local level operation: its structure, the procedure by which it interacts with consumers, and the employee environment; the next two chapters will focus largely on technical and implementation innovation within HPWSCo's overall operation. To begin, the next chapter describes the technical innovations HPWSCo adopted to manage existing resources effectively.





## **VI. Strategic Technical Innovation**

HPWSCo adopted a technical approach to maximize use of its existing surface water resources, rather than constructing additional supply, decreasing aggregate water demands in improved wards and thus providing more water to as-yet improved wards.

### **A. Managing Existing Resources Efficiently**

During the 1993 crisis, HPPC pressured HPWSCo to adopt a short-term solution to the city's lack of water that would focus on the most water-deficient areas. HPWSCo presented data demonstrating that careful management of the water supply network in areas closest to the head of the water distribution system would increase the water supply even for these areas short of water, sequentially improving water supply for the entire city for the long term. HPWSCo confirmed that this solution would be based upon existing water resources (primarily distributed from one 82,000 m<sup>3</sup>/day capacity water treatment plant called An Duong), not newly constructed sources of potable water supply, and that it could eventually provide all Haiphong consumers with 100% improved water. The technical key to this solution was neither the construction of more infrastructure (such as another water treatment plant or water intake canal), nor the improvement of one element of the utility's operations (such as replacing all of the water mains), but rather ward-by-ward diffusion of improvements commencing at the head of the distribution network. (See map in Annex I). In this way, HPWSCo maintained enough pressure in the water distribution system to reach upper stories and areas far from the water treatment plant, and maintained water quality from the treatment plant to the consumer.

This solution was unique in that it neither focused on areas with the greatest need, nor required the construction of additional infrastructure (with potentially onerous environmental and resettlement implications) as similar water supply utility reforms inspired by crisis often do (Thirkildsen, 1988). In addition, by improving water supply service delivery to consumers in certain wards early in its reforms, HPWSCo was able to convince consumers in later wards to cooperate with utility improvements and pay for improved service. Billings from these improved wards also provided revenue for subsequent ward improvements. (In contrast, while it would have eventually served all urban customers, improving one element of utility operations at a time would not have had the above effects). By implementing this ward model, HPWSCo followed the general advice of infrastructure professionals that one of the keys to strategic urban infrastructure management is selecting a production plan appropriate for the service demands and service delivery conditions of the area where services will be provided (Fox, 1994).

## **B. Enforcing Technical Standards within the Ward**

Within the ward, enforcing technical standards is also important to the success of the ward model. For instance, by metering all customers at the same time, the ward model avoids illegal connections, prevents residents from seeking free water from un-metered neighbors, and precludes the installation of difficult-to-maintain tangled connections built after ward improvement of branch distribution lines. By cutting off the old distribution network, the ward model prevents illegal abstractions and physical losses through leakage. By installing a master meter in each ward to reconcile ward billing with the amount of water the ward receives from the water treatment plant, the ward model provides data useful for increasing water bill collection efficiency. (Box 1 in Appendix II

presents the modifications mentioned above as important for reducing non-revenue water.)



## **VII. Transitional Innovations: Implementation Strategy**

HPWSCo's on-going successes would be difficult to achieve were HPWSCo not able to adjust its pattern of implementation of ward improvements. This is a particular concern, since some cases in the literature caution that it is difficult to learn from past experience and correct in future implementation (Narayan, 1993). Indeed, Vietnam traditionally has had a centralized planning approach, strictly calculating indicators and allocating inputs before technical project implementation (Agarwala, 1985). Yet, HPWSCo continues to evolve elements of their approach and the patterns of their operation throughout their scaling-out to adjacent wards beyond the standard framework suggested by the successful Lam Son pilot described in Chapter II. This experience supports the rare cases described in the literature of pilots that have succeeded in informing future project success. Jain's (no date available) study of scaling up in five non-governmental organizations (NGO) recognized that agencies should move from pilot mode to project implementation mode *before* they evolve standard program parameters and replicate a model, because a pilot model does not necessarily accurately account for future constraints and challenges.

### **A. Scaling-Out to Similar Areas**

HPWSCo's ward pilot succeeded in an area of Haiphong whose previous water supply service was relatively good. Although the pilot demonstrated an appropriate technical model for this area, the challenge for HPWSCo was to diffuse the pilot's success to adjacent wards. By definition, a pilot project is a focused, small, manageable effort that usually has easier access to resources (because it is visible and requires a relatively small level of investment). Whereas pilot projects often work well, the process of scaling-out,

can be rife with a variety of political, financial and technical problems that the pilot never faced nor could predict (Jain, n.d).

In the case of the ward model, however, subsequent wards that HPWSCo improved were similar to the pilot: they were of similar size in terms of both space and population; they had a similar ward regulatory and rule-enforcing administrative structure; they were under the same municipal jurisdiction; and they required similar financial and administrative resources. In other words, in scaling-out, the model of implementation remained the manageable ward. This sequential ward-by-adjacent ward approach proved important for the evolutionary improvement of HPWSCo's service delivery in later improved wards.

## **B. Feedback Learning for Future Improvements**

Each improved ward is a model for wards improved subsequently. Ward office organizational structure, billing and collection task distribution, and sequence of monthly activities have all changed based on wards' experiences of better practice. The pilot for scaling out ward improvements is based not only on the flagship Lam Son ward improved in 1993, but also on HPWSCo experience in adjacent wards.

Much of HPWSCo's inspiration for change comes from consumer and water supply employee feedback and is implemented by ward water supply employees. In addition to their proximity to the consumer and their discretionary tasks, the ward office's clear set of objectives and indicators of success promote accountability which in turn makes their efforts at reform that much more credible with HPWSCo headquarters. HPWSCo's

director notes that he places primary importance on his monthly meetings with each office, since these meetings provide him with the most cogent and practical ideas for HPWSCo reform modifications. The following examples illustrate the ward offices' role in monitoring water supply service delivery and adapting ward model design to further improvements:

Based on the success of the ward employee incentive structure for collecting 98% of water bills, HPWSCo rewards ward level decreases in non-revenue water, based on a percentage specific to each ward (since design, materials and construction practices all affect physical non-revenue water). Now, staff in other areas of HPWSCo operations receive similar incentives, *e.g.* water treatment plant employees earn a bonus for reliably maintaining water quality and decreasing unnecessary chemical usage.

A customer solution to reducing household water bills is locally known as “vodka making”: opening the tap just enough for water to drip without registering on the meter. Ward water employees confirmed this practice by investigating consumers with abnormally low water bills. HPWSCo is aware that ‘vodka making’ is primarily practiced on Thai and Chinese meter makes, used in the earliest improved wards (Luan, 1998). Thus, HPWSCo has experimented with different meter brands in subsequently improved wards, seeking a water meter that is fairly priced and more finely calibrated.

The construction of the distribution network in some of the first improved wards was of low quality. These wards therefore now have leaks in their distribution system that

account for non-revenue water levels above 30%. To improve this situation HPWSCo has adapted its ward level procedures, decentralizing responsibility for construction quality control to ward water offices in subsequently improved wards, which has measurably decreased non-revenue water in these wards, compared to those improved earlier. (This adaptation reflects the increasing priority that HPWSCo places on quality control, as the utility continues to monitor its indicators).

Thus, the ward model allows for continually correcting HPWSCo's course of improving service delivery in a series of geographically linked 'pilot' projects. While these improved wards will continue to provide lessons for those wards improved in the future, HPWSCo's case may also provide lessons for service delivery reform beyond Haiphong, as discussed in the next chapter.



## **VIII. Broader Implications: Institutional Lessons from HPWSCo Innovations**

Developing countries often grapple with difficulties in water supply service delivery ranging from a small proportion of consumers connected to the network and low water pressure, to a high percentage of non-revenue water and unwillingness to pay for poor quality water. As with many cities in the developing world, Haiphong long experienced these difficulties too. Yet, through a variety of innovations, HPWSCo transformed itself as an organization and is now providing improved water supply service delivery to its Haiphong customers. HPWSCo's success is understood in the climate of change catalyzed by Vietnam's *Doi Moi*, including a transfer of responsibility to local government units, a focus on the revenue earning potential of State Owned Enterprises, Haiphong's emphasis on its business potential, the legacy of ill-maintained water supply infrastructure, and consumers' increasing expectations for improved service delivery concomitant with economic growth.

Most importantly, HPWSCo's success is a result of the innovative transformations that helped it to succeed in a developing country situation where success has been uncommon. Through the story of HPWSCo's transformation, I have illustrated how a government agency can become much more effective and efficient. In conclusion, I wish to address the elements of HPWSCo change I believe to be most broadly relevant for water supply policy reform, keeping in mind the framework specific to this case. I break these relevant lessons into two categories: (1), the value of strong local units subject to central

standards and delivering decentralized service and (2), the value of implementing an infrastructure project gradually, focusing on units of manageable scale.

### **A. Service Delivery Decentralization**

HPWSCo decentralizes water supply service delivery to the smallest administrative unit, the ward. By creating local water supply offices and selecting members of the local community to staff these offices, HPWSCo creates a paradoxical partnership between the community as monitors of local office performance, and the community as allies of superior local staff performance. HPWSCo reinforces this collaborative relationship, tying it into overall HPWSCo performance, by creating indicator-based performance incentives that reward local offices with bonuses for achieving monthly billing targets. In addition to clearly defining standards of service delivery, these targets ensure that the community/local office relationship does not become an opportunity for rent seeking, since local employees are rewarded for providing HPWSCo with full billing collections.

HPWSCo also defines and enforces clear local level employee tasks and standards from the central level, thus providing employees with a supportive framework in which to carry out their jobs. These tasks are varied, however, and encourage local level employees to respond to consumer needs, thus allowing employees to use their own discretion within the frame of these centrally set standards.<sup>18</sup>

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<sup>18</sup> Interestingly, a forthcoming Andersen Consulting/Economist Intelligence Unit Report “Knowledge Workers Revealed: New Challenges for Asia,” notes the positive effect on work performance of employees who have a variety of tasks, adding that close supervision and too many rules are counterproductive for workers. With varied tasks and less supervision, workers have more opportunities to make lasting contributions to their organizations. The report finds that without the satisfaction of attempting to make these contributions, even with pay-based

Finally, HPWSCo's local level response to consumer need creates a more efficient utility. The proximity of the utility to the consumer means that maintenance requests can be addressed quickly and that HPWSCo can receive and respond to consumer feedback more directly. For instance, HPWSCo is effectively decreasing non-revenue water by finding and repairing leaks, maintaining meters and prohibiting illegal connections, all at the local level. At the same time, local offices are better able to inform the consumer about *e.g.*, the link between water tariff and improved service delivery. Most importantly, through its local offices, HPWSCo implements an effective billing system, metering consumption, reliably collecting tariffs and sanctioning for non-payment. Thus, consumers are encouraged to conserve water as they see the clear link between the amount they consume and the amount of their bill.

This decentralization to the ward level works well in the case of Haiphong. Local ward water supply offices are self-standing within the ward administration and cooperate with the Ward People's Committee and ward police. However, before extrapolating HPWSCo's experience with decentralized service delivery to other locations, policy makers should consider the appropriate administrative structure. In other instances, local partners could be mass organizations, non-governmental organizations or other organizations with ties to, and authority within, the community.

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compensation, workers will not be as satisfied, and the organization will not benefit from the possible extra contribution of workers seeking new ways to better carry out their tasks.

## **B. Small Scale Infrastructure Improvements**

In their efforts to improve water supply in Haiphong, HPWSCo has focused on managing existing resources, rather than constructing new sources of supply. Thus, the utility has avoided an ‘infrastructure monument,’ and incrementally improved service throughout the water supply network, beginning in the area closest to the water supply distribution network, and continuing improvements sequentially outward. In HPWSCo’s case this small scale approach, (*e.g.*, metering 100% of the consumers in one area, replacing the area’s distribution and branch pipework, and staffing a water supply office in the area), has allowed it to improve service delivery markedly in these areas. This has contributed to community support for further HPWSCo improvements, since consumers can see the result of HPWSCo’s efforts improving their water supply or that of others in Haiphong. This has strengthened HPWSCo’s relations with consumers in improved areas because HPWSCo has maintained its improvements, and convinced consumers that they too will eventually receive improved water supply service delivery.

Strikingly, HPWSCo’s small-scale approach also incrementally improves water supply in as yet improved areas. While they are not yet paying for improved water supply, these areas have water for more hours per day, at higher pressure, and of better quality than before HPWSCo commenced reforms. These improvements are a result of sounder pipework earlier in the distribution network.

In addition, the utility earns a revenue relatively quickly (3 months per area, on average), collecting tariff from consumers in areas that have been improved, rather than waiting to

charge consumers until an *entire* network has been improved (completed in years, depending on the extent of the network). Even in projects supported by bi- and multi-lateral donors, this revenue generation is a good indicator of the utility's ability to make a profit beyond this support and, in the case of HPWSCo, reinforces the concept of revenue generation through consumer payment with the formerly government-subsidized utility.

Finally, small-scale improvements allow HPWSCo to learn from previously improved areas. This feedback learning is facilitated by communication between local level and headquarters offices. HPWSCo began its transformation with a well-researched and successful pilot, scaling improvements out to areas of similar size and jurisdiction. This methodical implementation has allowed HPWSCo to progress through its reforms without large-scale errors or unforeseen difficulties.

This area by area improvement works particularly well in Vietnam, where each administrative unit is of approximately the same size, has a similar consumer base and wields similar political authority. It also works well in this case because HPWSCo has a surface water supply, rather than a ground water supply (where drilling another well to provide additional water often seems the most practical solution). HPWSCo maximizes the asset of a sound water supply treatment plant with capacity to serve a majority of its consumers. Other utilities may not have this advantage and thus may need to focus their resources, at least initially, on constructing additional sources of water supply. Where positive outcomes are certain and economies of scale are a primary concern, infrastructure construction may be better approach to water supply improvements.

However, many of HPWSCo's lessons about decentralizing service, providing consumers with a vision of improved service, piloting change, and learning from previous modifications, still apply in cases where a utility must begin its reform efforts with construction.

Ultimately, HPWSCo has improved its service delivery based upon Haiphong's needs and maintained these improvements throughout the diffusion of ward upgrades.

Haiphong Sanitation and Drainage Company is experimenting with a similar type ward model as they improve the city's decrepit sewerage system. In addition, technical and institutional elements of the ward model may have broad implications for Haiphong's development. Captivated by HPWSCo's success, and recognizing that HPPC is convinced of the ward model approach, the World Bank is recommending a "brick by brick" approach to the city's future development (Campbell, 1998). Thus, HPWSCo's ward model will set the foundation for future improvements in Haiphong, using wards as a base to administer projects for change.

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In addition, the following is a partial list of individuals interviewed directly during the author's Summer, 1998 work with HPWSCo.

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Tran Thi Oanh, Deputy Project Director, HPWSSP  
Vu Phong, Deputy Director, HPWSCo  
Vu Manh Hoa, Head of Customer Service Department, HPWSCo  
Le Thi Nguyet, Head of Personnel Department, HPWSCo  
Nguyen Kim Luong, Head of Accounting Department, HPWSCo  
Nguyen Huy Ha, Project Coordination HPPWSSP, World Bank Project  
Van Huu Huan, Deputy Head of Technical Department, HPWSCo  
Nguyen Quang Huan, Planning Department, HPWSCo  
Dang Quoc Khanh, Project Planning, HPWSSP  
Hung, Director of O Nam and Am Bien Ward's HPWSCo office.

TUPWS:

Trinh Dac Te, Vice Director (and member, HPPC Steering Committee for Water Supply)

Ministry of Construction:

Nguyen Sinh Hy, Deputy Director, International Cooperation Department  
Pham Ngoc Thai, Deputy General Director, Vietnam Water Supply, Sanitation and Environment

Soil and Water:

Harri Leppanen, Corporate Management Advisor, Team Leader, HPWSSP  
Hannu Huotarinen, Construction Bid Advisor, HPWSCo World Bank Project  
Sinikka Rinne, Financial Management Advisor, HPWSSP  
Markus Saari, Water Utility Advisor, HPWSSP

Tran Minh Anh Thu, Customer Service Advisor, HPWSSP  
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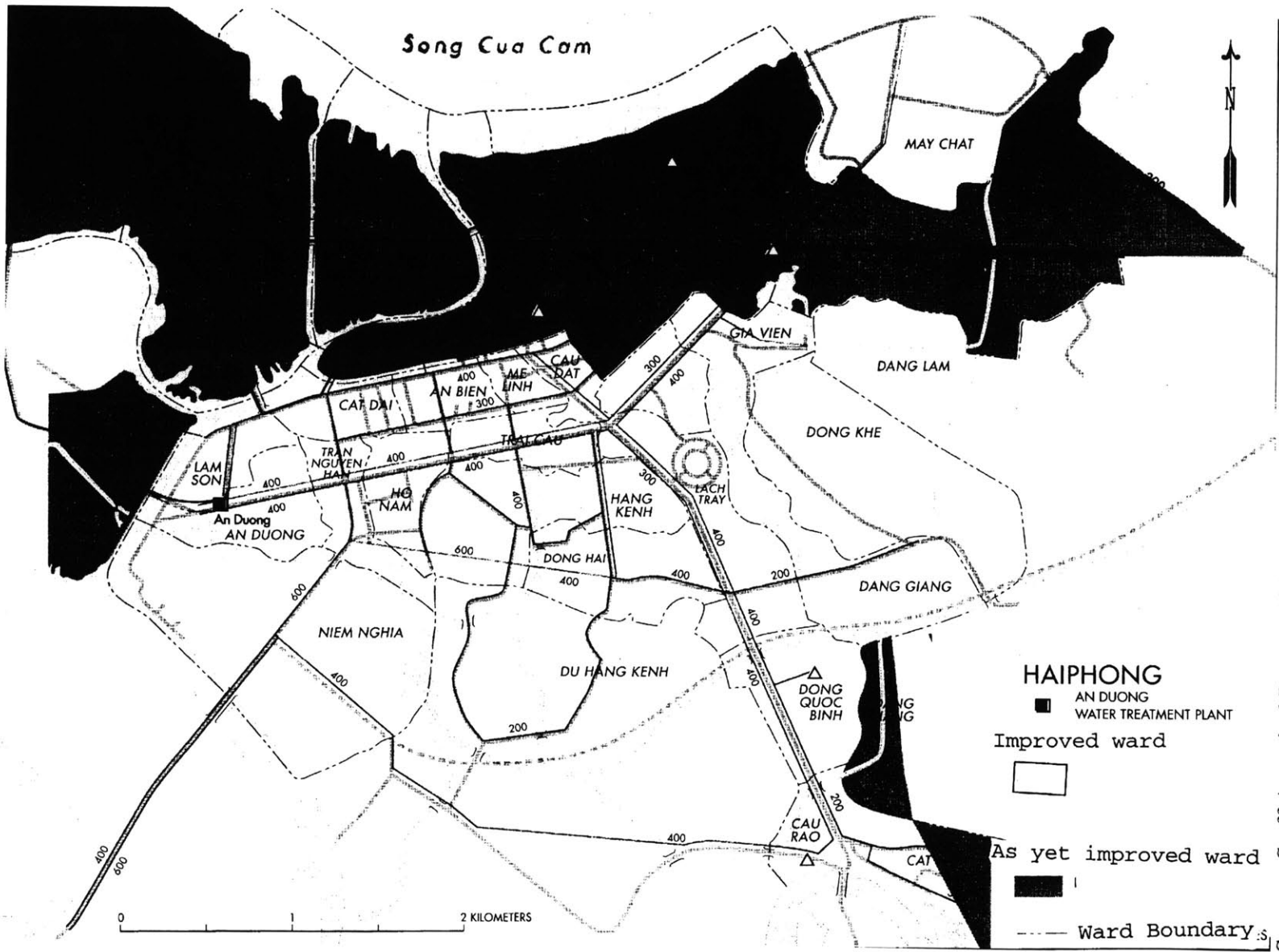
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**Appendix I: Map of Haiphong Showing Scaling-Out of Ward Improvements**



Source: Staff Appraisal Report, 1997.



## **Appendix II: The Ward Model: Key to Reducing Ward Non-Revenue Water**

An egregious problem for many developing country water supply utilities is the water (and thus revenue) wasted through non-revenue water. In general, the literature supports the notion that attempts to reduce non-revenue water are most successful when they are directed towards maintenance and reducing consumption losses: identifying users, revamping meter reading and billing, replacing defective meters, metering all connections, locating illegal connections, meter bypasses, and misidentification (e.g. commercial as household) of consumers. Reduction of leaks in the distribution system is also important for non-revenue water reduction, but secondary to the reduction of consumption losses, since indicators of developing country water utilities suggest that the consumption composition of non-revenue water is two times as large as the physical composition of non-revenue water, on average (Yepes, 1996). Thus, the ward model is well suited to rectifying the primary causes of consumption non-revenue water listed above.

HPWSCo's experience illustrates that it is important to provide an economic incentive to consumers to ensure effective water management. By metering consumers and fining them for lack of payment, HPWSCo creates a user-charge system that encourages a demand- rather than supply-side orientation to water supply service delivery. Additionally, HPWSCo works to prevent physical losses and illegal connections by cutting off the old distribution network, while relying upon the ward model to increase consumer awareness about water use reduction and to spot and report

visible distribution system leaks. These interventions to reduce non-revenue water, (along with increased billing and collection) provide HPWSCo with the revenue to continue on-going improvements.

The following box recapitulates the ward model's influence on decreasing non-revenue water. In addition, it provides ideas for modifications throughout water supply production, distribution, and consumption not directly related to the ward model.



## Box 1: Reducing Non Revenue Water

Based on HPWSCo experience, the following help to reduce non-revenue water.

### **Production**

- Protect water intake lines from illegal abstraction by covering them and diligently monitoring activity from water intake to treatment plant.
- Consider the most efficient way to use existing water supplies.
- Define quality standards for all parts of the production process.
- Provide bonuses to employees as an incentive for reaching efficiency targets.
- Discuss ways of reducing water losses with water treatment plant technicians.
- Inform employees that the utility insists on quality utility production.
- Ensure that the utility or, preferably, another entity monitors utility production.
- Diligently maintain all aspects of the production process.

### **Distribution**

- Improve the water distribution system beginning with the area closest to the head of the distribution network (e.g. the water treatment plant).
- As the water distribution network is improved, disconnect old distribution pipe mains that leak and are riddled with illegal connections.
- Install a master meter in each ward that reconciles water delivered to the ward and water billed by the ward offices.
- Meter every customer and provide them with a branch connection from the distribution system at the same time (e.g. over a period of 3 months for up to 3,000 connections) to prevent illegal connections, neighbors borrowing un-metered water from one another, and future installment of extraneous consumer connections which are difficult to maintain.
- Monitor for, and respond efficiently to reports of, leaking mains and distribution lines.
- Discuss ways of reducing water loss with construction sector technicians.
- Inform employees that the utility insists on quality installation of network distribution systems.
- Ensure that the utility or, preferably, another entity monitors utility distribution.
- Diligently maintain all aspects of the distribution process.

### **Consumption**

- Meter every consumer's water consumption.
- Reliably enforce consumer user charges based upon the rate of water consumption so that they have an incentive to consume less water.
- Provide convenient opportunities for consumers to inform of problems and learn about efficient water usage.
- Through a variety of media, raise public awareness about ways to conserve water.
- Involve consumers in planning, implementing and maintaining the water supply system.
- Install meters that register low volume water use.
- Provide consumers with a direct and responsive link to the utility.
- Inform consumers about their responsibilities and rights as well as those of the

## Box 1: Reducing Non Revenue Water

utility.

- Enforce fines for illegal connections, late payments and tampering with water meters.
- Respond efficiently to requests for new meter installations to discourage illegal connections as a consumer alternative to an unreliable utility.
- Monitor for, and respond efficiently to reports of, broken meters and leaks within branch network lines.
- Install master meters in various localities as an indicator of water use within the locality to ensure full accounting of tariff billing and collection.
- Inform the community that consumers who are mis-classified as “household” customers increase everyone’s water charge to encourage community involvement in accurate definition of commercial and industrial customers.
- Define quality standards for utility employees who work directly with consumers.
- Provide bonuses to these employees as an incentive for reaching these targets (such as 100% billings collected and 20% non-revenue water).
- Inform service employees that the utility insists on quality work.
- Ensure that the utility or, preferably, another entity monitors utility service.
- Discuss ways of reducing water loss with water utility company employees who work directly with consumers.