

Supplementary Study
on Human Resource Development
for Water Sector in the Middle Region,
Socialist Republic of Vietnam
Study Report

April 2009

JAPAN INTERNATIONAL COOPERATION AGENCY
GLOBAL ENVIRONMENT DEPARTMENT

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PREFACE

In response to a request from the Government of the Socialist Republic of Vietnam, the Government of Japan decided to implement the Project on Human Resources Development for Water Sector in the Middle Region of Vietnam (hereinafter referred to as “the Project”), and entrusted the Project to the Japan International Cooperation Agency. The Project was implemented from March 2007 to February 2009.

Activities and achievements of the Project were evaluated by the Terminal Evaluation of the Project in the middle of January 2009 conducted by evaluation team consisted both of Vietnamese side and Japanese side.

After the termination of the Project, considering possibility of further cooperation, JICA conducted a supplementary study to collect relevant additional information and clarify the current situation of the target sector; especially field of human resources development of water supply sector. JICA selected and dispatched a study team consists of Mr. ANDO Katsuhiko, JICA Vietnam Office, and Mr. ONO Atsuo UNICO, International Corporation between February 24 and March 17, 2009.

The team visited concerned ministries, institutions and water supply utilities, held discussions, conducted field surveys, and prepared this reports.

I hope that this report will contribute to the promotion of further technical cooperation.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Republic Vietnam for their close cooperation extended to the study and look forward to their continuous supports.

May 2005

NAKAGAWA Kikuo,
Director General
Japan International Cooperation Agency

Photo



College of Urban Works Construction



College of Construction No2



College of Construction No3



Hoi An WSC



Phu Yen WSC

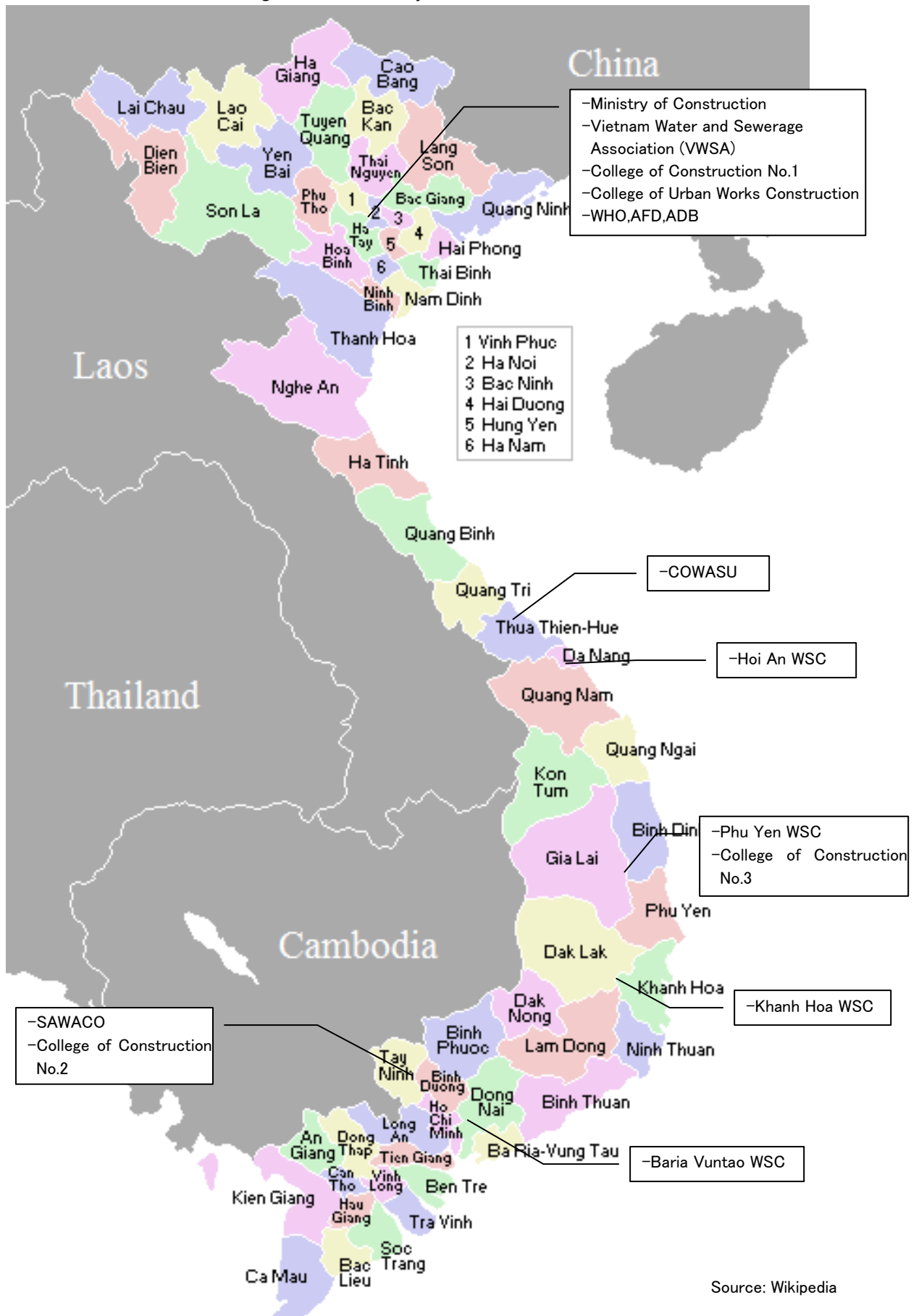


Khanh Hoa WSC



Baria Vuntao WSC

Organization surveyed and Location



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Abbreviation

<u>Abbreviation</u>	<u>English or French</u>
ADB	Asia Development Bank
AFD	Agence française de Développement
BWACO	Baria-Vuntao Water Supply Joint Stock Company
COWASU	Tua Thien Hue Construction and Water Supply State-One Member Company Limited
DMA	District Metered Area
GIS	Geographical Information System
Hoi An WSC	Hoi An Water Draining and Construction Company
HRD	Human Resource Development
ISO	International Organization for Standardization
KAWASCO	Khanh Hoa Water Supply and Sewerage Company
O&M	Operation and Maintenance
ODA	Official Development Assistance
OJT	On-the-Job-Training
P-CERWASS	Provincial Center for Rural Water Supply and Environmental Sanitation
Phu Yen WSC	Phu Yen Water Supply and Sewerage State-one member Limited Company
PPC	Provincial People's Committee
SAWACO	Saigon Water Corporation
TCWE	Training Center for Water and Environment
VWSA	Vietnam Water Supply and Sewerage Association
WHO	World Health Organization
WSC	Water Supply Company
WSP	Water Safety Plan
WSP	Water and Sanitation Program
WSTC	Water Sector Training Center

1. Outline of the Study

1.1 Background

The Project on Human Resource Development (HRD) for Water Sector in the Middle Region of Vietnam was implemented to improve the capacity on management and operation of Tua Thien Hue Construction and Water Supply State-One Member Company Limited (COWASU) for declaration of safe drinking water. The project was conducted from March 2007 to February 2009 during 2 years. During the project, 19 experts in five fields, such as water quality management, water treatment, water distribution management, human resource development and customer service, were dispatched.

An evaluation study has been conducted 1 month before the project's termination, and the activities and the achievements has been reviewed and evaluation with five evaluation indicators.

1.2 Purpose

Main purposes of this study are 1) to collect relevant information on WSCs and compare COWASU performance to other WSCs in technical and management aspects, 2) to collect basic information on HRD in urban water supply sector for considering succeeding cooperation plan.

1.3 Organizations Surveyed and Area

Organization surveyed are the governmental organization (MOC), COWASU, WSCs, training institutions (College of Construction No.1, 2, 3, College of Urban Works Construction), international donor organizations (WHO, AFD, ADB) shown as below.

Table1-1 Organizations surveyed and Location

Category	Organization Name	Location
Governmental Organization	Ministry of Construction (MOC) - Infrastructure Dept. - Personnel Dept.	Hanoi
Water Supply Company (WSC)	Thua Thien Hue WSC (COWASU) Saigon WSC (SAWACO) Baria-Vuntao WSC (BWACO) Khanh Hoa WSC (KAWASCO) Phu Yen WSC Hoi An WSC	Thua Thien Hue Province HCMC Province Baria-Vuntao Province Khanh Hoa Province Phu Yen Province Quang Nam Province

Training Institution	College of Construction No.1 College of Construction No.2 College of Construction No.3 College of Urban Works Construction	Hanoi HCMC Phu Yen Hanoi
International Donor Organization	Agence Française de Développement (AFD) World Health Organization (WHO) Asian Development Bank (ADB)	Hanoi
Other Organization	VWSA	Hanoi

1.4 Members of the Survey

Mr. ANDO Katsuhiko	Cooperation Planning	Senior Project Formulation Advisor, Vietnam Office, JICA
Mr. ONO Atsuo	Water Supply Administration and Management	Consultant, Senior Staff, Economic Cooperation Dept. UNICO International Corporation

1.5 Schedule of the Survey

The survey was implemented as following schedule.

No.	Date		Contents	Stay
1	Feb.	24 Tue	Narita Dp.→ Hanoi Av.(JAL11:00 - 15:10) PM Visit JICA Vietnam Office	Hue
2		25 Wed	Am move to Hue WSC PM Survey on COWASU	Hue
3		26 Thu	AM Survey on COWASU Move from Hue to Hanoi	Hanoi
4		27 Fri	Visit JICA Vietnam Office 10:00 College of Urban Works Construction	Hanoi
5		28 Sat	Arrangement and analysis of collected material	Hanoi
6	Mar.	1 Sun	Arrangement and analysis of collected material	Hanoi
7		2 Mon	9:00 AFD 14:00 WHO	Hanoi
8		3 Tue	10:00 VWSA& Ministry of Construction (MOC) Move to HCMC18:35-20:35	Ho Chi Minh
9		4 Wed	9:00 SAWACO 14:30 College of Construction No.2	Ho Chi Minh
10		5 Thu	Move from Ho Chi Minh to Vung Tao City, 14:00 Ba Ria Vung Tao WSC and WTP	Ho Chi Minh
11		6 Fri	Move from HCMC to Nha Trang City 14:00 Khanh Hoa WSC	Nha Trang
12		7 Sat	Arrangement and analysis of collected material	Nha Trang
13		8 Sun	Arrangement and analysis of collected material	Nha Trang

14	9	Mon	Move from Nha Trang to Phu Yen by car 8:00 Construction College No.3, 14:00 Phu Yen WSC Move back to Nha Trang	Nha Trang
15	10	Tue	Move from Nha Trang to Da Nang City 14:00 Hoi An WSC	Danang
16	11	Wed	Move from Da Nang to Hanoi, JICA Vietnam Office	Hanoi
17	12	Thu	9:00 VWSA, 14:00 College of Construction	Hanoi
18	13	Fri	10:00 MOC (Personnel Dept.), 14:00 College of Urban Works Construction	Hanoi
19	14	Sat	Arrangement and analysis of collected material	Hanoi
20	15	Sun	Arrangement and analysis of collected material	Hanoi
21	16	Mon	AM Report to MOC, 16:00 ADB, JICA Vietnam Office, Hanoi Dp.(JAL23:55)→	in flight
22	17	Tue	→Narita Ar.(06:45)	

WSC --- Water Supply Company

WTP --- Water Treatment Plant

VWSA --- Vietnam Water Supply and Sewage Association

1.6 Survey Method

The expert sent the questionnaire sheets to institutions through e-mail beforehand in principle, and collection and confirmation were done in the visit. Also the expert tried to visit water treatment plants and laboratories as many as possible.

2. Current State of Urban Water Supply Sector

2.1 Outline of Urban Water Supply Sector

2.1.1 Classification of City and Town

Cities and towns in Vietnam are classified into 6 categories as Class I-V in Vietnam as shown below. Hanoi and Ho Chi Minh City is categorized in special cities.

Table 2-1 City Class and Population

Class	Type	Population (thousand)	Number
Special Cities	Largest Cities	$\geq 1,500$	Hanoi, Ho Chi Minh City
1	National Cities	500 ~1,500	3
2	Regional Cities	250 ~500	12
3	Provincial Cities	100 ~250	16
4	District Towns	50 ~100	58
5	Communes	4 ~50	612

Source: World Bank (2006) "Water Supply and Sanitation Strategy"

2.1.2 National Policy and Target in Urban Water Supply Sector

Orientation on Water Supply Development of Urban Areas and Industrial Zones in Vietnam

A primary national policy in urban water supply sector has been introduced by "Orientation on Water Supply Development of Urban areas and Industrial Zones in Vietnam up to 2020" in 1998(Decision No.63/1998/QD-TTg/ 18 Mar 1998). This orientation set up the main directions of urban water supply sector up to 2020 as follows; 1) to ensure a safety drinking water for all people amounted for 120-150 L/cap/day up to 2020, 2) to implement a water sector reform including financial policies, 3) to install modern technology and equipment and strengthen a HRD system, 4) to promote a participation of all private and economic sector.

The orientation also refers to privatization in the sector as WSC should try to ensure financial autonomy during 3-5 years. It intends to mean not only recovering O&M cost, but also paying the expansion and improvement cost by their own finance responding to an increasing demand.

However, after establishment of the old orientation, there is no significant progress, thereby the government had to review the target. MOC already developed a new orientation, and is waiting an approval from the prime minister at present (Decision on the Orientation on Development of Water Supply of Urban areas and Industrial zones in Vietnam up to 2025). MOC mentioned that it will be approved in March 2009 in the earliest case, in April 2009 in the latest case.

Statistical Target

Targets in urban water supply sector indicated in the old and new orientations are shown as below.

Table 2-2 Targets by the Old Orientation (1998)

Category	City class	2010	2020
Water supply	Special Cities, Class 1	165L/cap/day (100%)	180L/cap/day (100%)
	Class 2	150L/cap/day (95%)	165L/cap/day (100%)
	Class 3,4,5	120L/cap/day (90%)	150L/cap/day (100%)
	District towns and communes	80-100L/cap/day (80%)	120L/cap/day (100%)
Non-revenue water(%)	Less than 40% in 2000		

Source: Ministry of Construction (1998) "Orientation on Water Supply Development of Urban Areas and Industrial Zones in Vietnam up to 2020"

Table 2-3 Targets by the New Orientation (2009)

Category	City class	2015	2025
Water supply	Class 1-4	120L/cap/day (90%)	120L/cap/day (100%)
	Class 5	100L/cap/day (70%)	
Non-revenue water (%)	Class 1-4	<25%	<15%
	Class 5	<30%	
Service hours	Class 1-4	24h	24h
	Class 5	satisfy actual demand	

Source: Ministry of Construction (2009) "Draft Orientation on Water Supply Development of Urban Areas and Industrial Zones in Vietnam up to 2025"

The main differences between old and new orientation are 1) water supply service hours is added as a target, 2) water supply amount and non revenue water ratio are modified, 3) target years are changed from 2010 to 2015 in short term and from 2020 to 2025 in long term.

In terms of water supply amount, the old target in 2020 is set in the range of 120-180 L/cap/day depending on city classes. Meanwhile, the new target is unified at 120 L/cap/day. The new target on non revenue water ratio is changed from less than 40% until 2000 to less than 25% (Class 1-4) and

less than 15% until 2025. Service hours are modified to 24 hours except for Class 5 cities until 2015, and for all cities until 2025.

Outline of New Orientation (Draft)

Main points of the draft new orientation are indicated as below:

- Water supply sector is a public service one under the State's supervision. All Vietnamese citizen have right to use clean water.
- WSC in provinces shall make agreement on water supply services with local authorities and are responsible for managing, supervising over water supply for urban areas and industrial zones in the provincial territory.
- The government promotes the participation into water supply activities of private sectors. Equitization¹ in WSCs is a focus in 2010.
- Water price must be reasonable and enterprises in water supply field must operate effectively. Water tariff is adjusted properly according to the principle of ensuring balance of interests between enterprises and water users.
- The government studies and builds up law on water supply and sewerage.
- People's Committees of provinces and cities organize the implementation ensuring water supply safety.
- Water supply activities should not be limited by administrative borders.
- MOC strengthens and develops water sector training institutions in the Northern, Central and Southern of Vietnam.
- MOC researches and establishes laboratories and monitoring stations in the Northern, Central and Southern of Vietnam.
- People's Committee encourages foreign and domestic enterprises, organizations and individuals to invest, research and operate water supply system for urban areas.

¹ The definition of "equitization" is introduced by ADB as "a privatization process, in which provincial state-owned water companies are corporatized and incorporated into companies with shares". ADB (2008) "Technical Assistance Report, Socialist Republic of Vietnam: Preparing the Hue Water Supply Project".

Decree on the Production, Supply and Consumption of Clean Water

The decree comprehensively defined the production, supply and consumption of clean water has promulgated on July 2007 (Decree No.117/2007/ND-CP/11 Jul 2007). Urban water supply sector in Vietnam is undergoing an important transition period by the decree.

According to ADB, the new decree changes the definition of water as a social good to water as a commercial good while fully considering poor people and as exception areas where faces difficulties². The government again indicates a clear direction that privatization of WSC as state company to joint stock company will be promoted, and that governmental subsidy will gradually be decreased. Also it emphasizes to set up an appropriate water tariff level ensuring cost recovery and make a profit.

Regulation on Water Supply Security

WHO has been working for formulating Water Safety Plan together with MOC and VWSA, as the result of it, a regulation on water supply security was authorized in December 2008. Decision No.16/2008/QD-BXD, 31 Dec 2008 is one legal framework to define the plan of clean water production, supply and consumption. The regulation provides some guidance for planning, implementing and monitoring. The regulation is applied to the domestic and foreign organizations, individuals involved in the activities of production, supply and consumption of clean water in Vietnam. According to the regulation, water supply entity is responsible for developing WSP and indicating a road map consisted of the following 10 steps.

Table 2-4 10 Steps for Development of WSP

Step	Contents
Step 1:	Staffing for implementation of safe water supply plan
Step 2:	Document compilation of description of water supply system, water users
Step 3:	Formulation of technology process chart of water supply system
Step 4:	Identification, assessment and prioritization of potential risks and dangers to water supply system
Step 5:	Identification of prevention and control measures of risks and dangers

² ADB(2008) "Sector assistance program evaluation urban sector and water supply and sanitation in Vietnam – Evaluation approach paper - "

Step 6:	Regulations on the standards for checking, assessing the implementation of prevention and control measures
Step 7:	Checking, assessment on implementation of risk, danger prevention and control measures and establishment of assessment criteria for the safe water supply implementation
Step 8:	Elaboration and implementation of supporting plans
Step 9:	Establishment of precautionary process of water supply entity
Step 10:	Documentation and organization of information, communications

Source: WHO (2009) "Roadmap Development for scaling up Water Safety Plans in Vietnam"

Guideline on the Principle, Determination Method and Jurisdiction to Set the Tariff for Clean Water at Urban Areas, Industrial Zones and Rural Populous Clusters

The guideline on setting up water tariff by MOC mentioned that people's committee should increase water tariff gradually for recovering the cost (Circular No.3/1999/6 Jun 1999). However, Ministry of Finance and MOC indicated a guideline in 2004 again because of insufficient progress. The guideline described that water tariff should be set up considering that the profit from water supply works is less than 3%.

Meanwhile the guideline also indicated that Ministry of Finance should set up a framework for water tariff considering localities in each region, that provincial people's committee determine water tariff in each province with an approval of Ministry of Finance, and that each director of WSC submit a draft proposal for setting water tariff based on this guideline.

2.1.3 Water Supply Demand and Necessary Investment

The old orientation (1998) indicates estimation on future water supply demand and necessary investment as below.

It described that it would be necessary to invest 3.57 billion US\$ up to 2020. The new orientation draft does not show any required amount of investment.

Water Sector review report described that the government invested 18,567 billion VND in water supply schemes, of which the foreign investment share was 15,020 billion VND (81%). The investments have mainly focused on water generation, with only 10-15% of the capital used for the existing pipeline distribution networks, with little else upgraded³.

³ ADB, Netherlands Embassy, Danida, and AusAID (2008) "Water Sector Review, Draft Final Report"

Table 2-5 Estimated Water Supply Demand and Necessary Investment

Phase	Urban Population (mil)	Ratio of served population (%)	Standard	Water demand (mil m ³ /day)			Estimated investment (mil US\$)
				Domestic	Industry	total	
1996	14.7	47%				2.50	
2000	23.4	75%	120L/cap/day	2.10	2.20	4.30	900
2010	30.4	95%	150L/cap/day	4.30	4.50	8.80	2,165
2020	40.6	100%	165L/cap/day	7.59	8.35	15.94	3,570

Source: Ministry of Construction (1998) "Orientation on Water Supply Development of Urban Areas and Industrial Zones in Vietnam up to 2020"

2.1.4 Current State of Urban Water Supply Sector

The urban population with access to clean water was estimated for over 14 million, about 62% of the urban population, according to the statistics in 2006.

Approximately 70% of water resources depend on surface water from rivers and reservoirs.

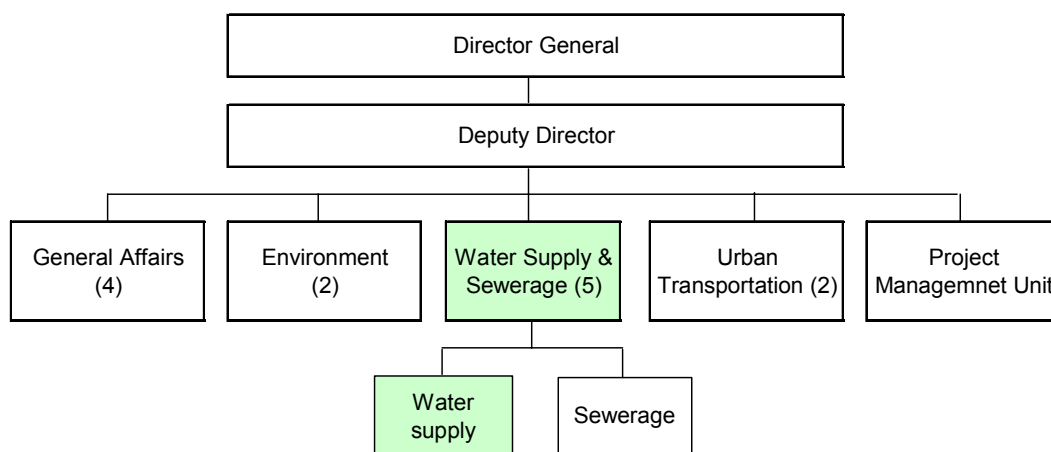
The total design capacity in 1998 was only 2.1 million m³/day; however that in 2008 increased up to 5.48 million m³/day. Currently the average operational capacity is 4.2 million m³/day; about 75% of the design capacity. The government insists that further investment is necessary to expand the capacity up to 9.2 million m³/day by 2015. The average non-revenue water ratio was improved from 42% in 1998 to 32% in 2008.

2.2 Main Actors and Implementation System in Urban Water Supply Sector

2.2.1 Ministry of Construction (MOC)

MOC has a responsibility for formulating policies and mechanism on water supply operations in urban areas and industrial zones nationwide according to the Decree No.117/2007/ND-CP in 11 July 2007. Water Supply and Sewerage Section in Infrastructure Department has a duty of exercising urban water supply. MOC promulgated the design standard on water supply distribution system and facilities in 2006 (Decision No.06/2006/QD-BXD).

Organization Chart of MOC is shown as below.



Source: Interview survey

Figure 2-1 MOC Organization Chart

2.2.2 Water Supply Company (WSC)

WSC has a responsibility for provision of water supply to urban areas and operation and maintenance both of the treatment plants and distribution networks. Currently 68 water supply entities manage over 420 water supply systems. The quantities of employees in WSC were 17,457 persons in 2005, in which, management officers: 1,323 persons, operation workers: 11,437 persons, administrative officers: 3,061 persons and technical staffs: 1,636 persons.

The orientation (1998) described the improvement of financial capacity. WSC must create income from business activities to cover not only operation and maintenance costs, but also expansion of the facilities and the cost of human resource development aiming at responding the water demand increase. WSC should have financial autonomy. Also it mentioned that WSC had a responsibility to return a loan by their own business activities if they borrowed it.

Organizational Type of WSCs

Organization types of WSCs are mainly categorized into two types, state one member Ltd company/ state-owned company, and joint stock company. Currently only 3 joint stock companies as organization type exists: Son La WSC and Phu Tho WSC in the northern region (from 1 March, 2009) and Baria Vung Tao WSC in the southern region.

Meanwhile, it is appeared that there are some types in the state companies from the survey. Organization Type ① is that state company controls all water supply systems (including intake

water, water treatment plant, distribution etc.) in the target area. Organization Type ② is that the mother company controls all of subsidiary state companies, and each of them is an independent organization type based on each water supply systems within the target areas. For instance, in case of Quang Nam province, Quang Nam WSC as a mother company manages 6 subsidiary companies including Hoi An WSC existing in the province. Organization Type ③ is that the joint stock company manages each water supply system, and the mother company controls these subsidiary companies. The mother company has a similar organization type as a holding company.

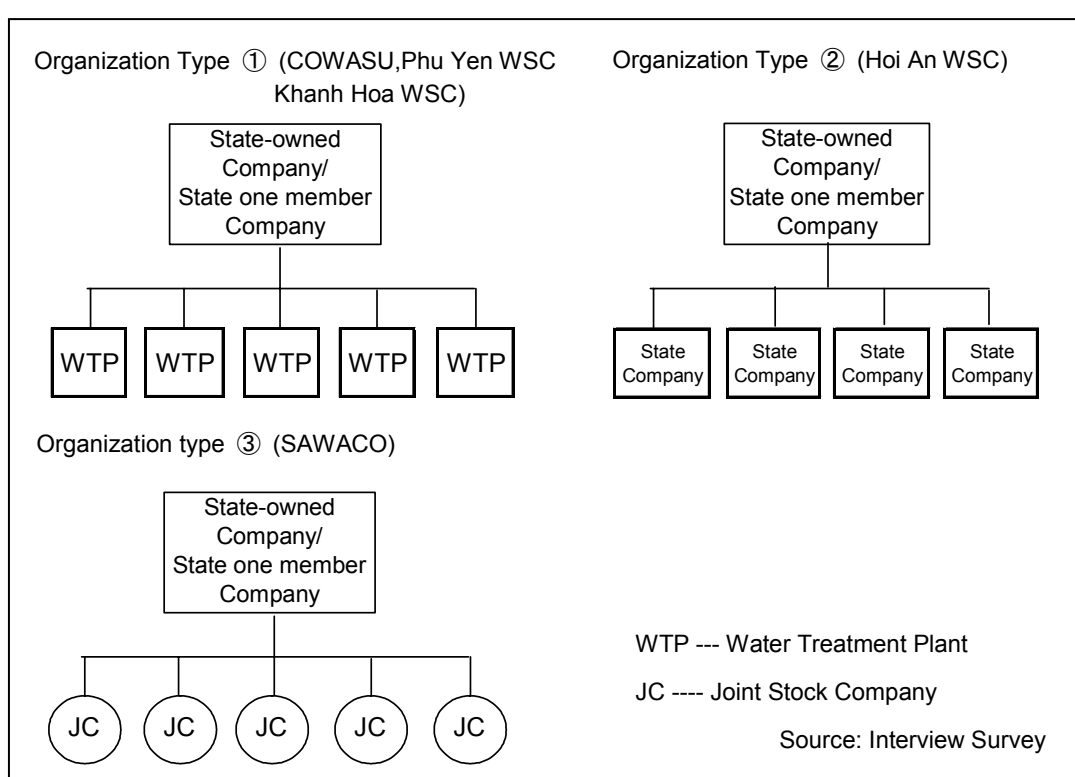


Figure 2-2 Organization Type of State-owned/ State-one-member Company

2.2.3 Vietnam Water and Sewerage Association (VWSA)

Outline of VWSA

VWSA was established in 1988 as one of the MOC related organizations. The charter of VWSA was modified in Dec. of 2005, and Decision No.129/2005/QD-BNV promulgated by Ministry of Interior defined the role and function. Main purposes of the activities are to unify all organizations such as companies, governmental officers, scientists concerning water supply sector, and to enhance development of member's knowledge and skill.

The following activities are described in the new charter.

- To organize or cooperation to organize conferences, seminars, special exposition and professional round table
- To assist researches and scientific and technical experiments in the field of water supply, sewerage and sanitation
- To carry out services on management, science and technology pursuant to existing laws through the application of the technical and technological progress

- To publish periodical magazines on the water supply, sewerage; documents on science, technique and management concerning water supply, sewerage and sanitation as regulated by the laws

- To keep contact with other local and foreign associations in accordance with the laws to exchange experiences and take advantage of international support to enable the VWSA to develop more and more

There are 6 permanent staffs including chairman, director, staffs in the head office. 4 vice-directors who are generally stationed at each WSCs do not attend the head office.

With regard to local offices, there are 4 branch offices in the North, the Middle, and the South, Ho Chi Minh City. The representative WSC set up the liaison offices in the representative WSC without any VWSA staffs. The Science and Technology Board consisting of mainly member universities and outside experts is responsible for researching technical issues and conducting surveys.

Currently VWSA has 239 members, and the annual member fee is 10 million VND at the maximum for the organization with a large turnover such as the largest WSC in HCMC and Hanoi. The member fee is differed depending on the turnover in stages. The annual budget of VWSA is totally 1.5 billion VND, in which 0.4 billion VND is from member fee, the remaining 1.1 billion VND is from international organizations and the domestic companies. VWSA has not received any governmental subsidy as a Non-governmental organization.

Main Activity of VWSA

Seminar and Training Course

VWSA has opened seminars 1-2 times per year with their own budget. The topics are diverse, for instance, new regulation, decree, decision, the developed manual, Qualification and Upgrading Training. In terms of a cooperation activity with international donors, they conducted a benchmarking survey in collaboration with the World Bank in 2002, and the update survey in 2008

again. In 2009, they are planning to have a fixed asset management training seminar in each the North, Middle, South. Furthermore, training courses on Water Safety Plan following the WHO standard were held together with WHO in 2007 and 2008. In 2009, they will invite the remaining WSCs which did not participate in the previous training courses. The costs of both training courses were funded by the international donor organizations. VWSA plans to organize a capacity development course for top management, however, are looking for a funding agency because of a lack of finance.

Survey and Research

The Science and Technology Board consisting of universities, outside experts, and member companies is responsible for conducting survey and technical research. They are under preparation of a manual for management of distribution pipeline and for GIS presently. In the past, they researched various topics such as a mechanism to reform water supply and sewerage sector. They developed an operation and maintenance manual for water supply system in collaboration with water and sanitation program (WSP) of the World Bank.

Meanwhile, VWSA has generally contributed to make comments on the significant issues like new legislations, an establishment of water tariff system, a development of design standard before formally publicized, and feedback to MOC. They similarly took an initiative for developing a technical standard for skilled worker's Qualification and Upgrading Training, responding to the request from WSCs. At that time, the director of Quang Nam WSC contributed to develop after conducting field survey to hear comments from some WSCs in nationwide for a several months.

Publication

VWSA publishes a magazine "nuoc" every two months. Member companies contribute to submit articles.

2.2.4 Provincial People's Committee (PPC)

Provincial People's Committee holds responsibility to exercise the state management over water supply operations in their respective areas. Currently most WSCs surveyed are state-owned company; thereby PPC eventually determined water tariff and investment plan. In case of COWASU as state one member company, the director has authority to make a decision on spending their half of the budget, while the director has to be responsible for the decision.

Department of Construction/or Department of Transportation and Public Works in PPC are specialized and advisory agencies helping PPC to exercise the state management over water supply in municipalities and industrial zones.

2.2.5 Ministry of Health

Ministry of Health is responsible for exercising the state management over public health, promulgating standards for clean water, and inspecting and monitoring the implementation of standards for the clean water across the country.

2.3 Activities of International Donor Institutions in Urban Water Sector

2.3.1 WHO

Table 2-6 Main Assistance Project/ Program by WHO

Program/ Project	Period	Type	Activity
Water Safety Plan (WSP)	2006 - present	TA	Pilot training course: Hai Duong WSC(2006), WHO introduced the concept of WSP to Vitenam.
			Pilot training course: Thua Thien Hue WSC(2007), Vinh Long WSC(2007)
			Training course 45 WSC targeted, in North, Central, South regions (2007, 2008)

Source: Interview survey

WHO has mainly been supporting for Vietnam in the field of communicable disease and health sector development, and water and sanitation is recognized as one of health sector development. WHO has provided nationwide training on Water Safety Plan (WSP) and has advocated to the government, and the action will be assumed to influence future WSCs activities. WHO has organized training seminars for introducing the concept of WSP to WSCs and implementing it in collaboration with VWSA. At the same time, they has conducted pilot model projects for developing WSP selecting Hai Duong WSC in 2006,COWASU in 2007,Ving Long WSC in 2008. In the fourth year 2009, the training will be provided to the remaining 23 WSCs, thereby total 68 WSCs will be covered.

2.3.2 AFD

Table 2-7 Main Assistance Project/ Program by AFD

Program/ Project	Period	Type	Financial value (mil)	Province/towns targeted
Third provincial towns water supply and sanitation project	2002-2008	Loan	US\$112 mil (AFD) US\$60 mil(ADB)	Kien Giang, binh Duong, tay Ninh, Phu Yen, Ninh Tuan (5 provincial and 2 district towns)
Mekong Delta small and district towns water supply program	2006-2015	TA + Loan	€36 mil(Loan) €2 mil (Capacity building, TA)	Cao Tho, An Giang, Dong thap, Tra Vinh, Vinh Long, Ben Tre (all in Mekong delta area, targeting Class 4,5 cities)
Lao Gai infrastructure investment program	2007-2013	Loan + Grant	€25.9 (€22 Loan + €0.8 Grant)	Lao Gai province

Source: World Bank (2008) “Donor Project/Program List” and Interview survey

The assistance policy of AFD focuses on the following three fields; (1) financial sector and small private enterprises, (2) basic infrastructure (drinking water sanitation, urban waste, energy, transportation), and (3) agriculture and food security. AFD implemented “Third provincial town water supply and sanitation project” co-financed with ADB targeting provincial towns at Class 3 for 7 years. The final target of the project was to improve living environment, and the project closed in 2008 had supported for construction of water supply and sanitation facilities, public health education, and improvement on WSC’s financial balance.

Currently AFD provides “Mekong Delta small and district towns (Class 4-5) water supply program”, technical assistance and loan program until 2015, conducted by Vietnam Development Bank as a counterpart organization. The program plans to support for capacity development of WSC staffs in the fields of non-revenue water countermeasure, expansion and replacement of distribution network, customer management, improvement of financial balance, socio-economic survey and willingness to pay survey, and consideration on appropriate water tariff level.

Meanwhile, “Lao Cai infrastructure investment program” targets on comprehensive infrastructure development (urban road, treatment of sewage and drain, water supply), however, supports on water supply sector will be limited only to expansion of distribution network and water treatment plant.

2.3.3 ADB

Table 2-8 Main Assistance Project/ Program by ADB

Program/ Project	Period	Type	Financial value (mil)	Activity
Third provincial towns water supply and sanitation project	2002 -2008	Loan	US\$112 mil (AFD) US\$60 mil(ADB)	- To improve people's health and quality of life in project towns by constructing water supply, drainage and sanitation facilities, and providing health and hygiene education - Kien Giang, binh Duong, tay Ninh, Phu Yen, Ninh Tuan (5 provincial and 2 district towns)
Supporting Water Operator's Partnership	2007 -2008	TA	US\$2.0mil	- To increase management capacity improved through benchmarking exercise and through technical training workshops
Hai Phong Water Supply Project	2007 -	TA, Loan	TA :US\$1mil Loan: US\$15mil	- Capacity development and implementation support (a resettlement plan and compensation policy framework and procedural guidelines)
Da Nang Water Supply Project	2007 -	TA, Loan	TA :US\$1.5mil Loan: US\$50mil	- Extension and rehabilitation of the distribution network, and an institutional strengthening program
Vietnam Water Sector Review	2008	TA	US\$0.31mil (ADB) US\$0.71mil (Neitherland Embassy) US\$0.05mil(Danida) US\$0.06mil(AusAID)	- To review the state of the water sector and to establish a common framework to guide development decisions targeting water supply, sewerage, irrigation, water resource and other sub-sector.
Hue Water Supply Project	2008 -	TA, Loan	TA :US\$1.5mil Loan: US\$30mil	- To increase production capacity, extend and rehabilitate the distribution network, and agreed design of an institutional strengthening program
Central Region Rural Water Supply and Sanitation Sector Project	2008 -	TA, Loan	TA :US\$0.6mil Loan: US\$45mil	- To improve environmental conditions in 6 priority provinces in the North Central and South Central regions. - Expected to improve water supply and sanitation services for rural residents
Mekong Water Supply and Sanitation Project	2008 -	TA, Loan	TA :US\$2.4mil Loan: US\$13mil	- To develop the water supply and sanitation infrastructure in the secondary towns along the transport corridors. - Dong Ha, Quang Tri, Lao Bao, and Cua Viet

Source: World Bank (2008) "Donor Project/Program List" and Interview survey

ADB has been the largest donor agency in urban water sector, and the positioning has not changed currently.

According to an approach paper for evaluation program in water sector, they extended loan project to large cities such as Ho Chi Min City in phase 1 during 1990s, and shifted to provincial cities in phase 2 from the first part of 2000s. In phase 3 from the latter part of 2000s, they have conducted projects focusing on small cities and towns in Mekong delta area and the middle regions.

Technical assistance project in COWASU implemented from 2008 plans to support in the field of F/S, an establishment of a framework for public private partnership, equitization, energy efficiency, ISO14001, ISO24512 etc.

3. HRD in Urban Water Supply Sector

3.1 Development Policies and HRD

Orientation for Urban Water Supply Development (1998) as an orientation for urban water supply sector indicated the importance of HRD in future as below. The orientation pointed the necessity to provide favorable conditions for local staffs to work with foreign experts because of a shortage of good experts in Vietnam.

However, the concrete action has not been taken without a large progress.

- The target is to supply enough trained staff for all levels from central to local level by 2005
- Building training programs from directors, managers, to O&M workers
- Taking full advantages of technical support and technology transfer, especially skill of experts who are supervising implementation, operating and managing water supply works in Vietnam.
- Creating favorable conditions for local staff to work with international experts to improve level, using water supply projects as real schools for on-the-job-training

After the modification of the old orientation, a new orientation (2009) recognizes significance of HRD (waiting an approval from the prime minister, March 2009). Main implementation policies in HRD are shown as below.

- Water service sector is a public sector one under the State's supervision
- Water price must be reasonable, and enterprises in water supply must operate effectively
- Water price is adjusted periodically according to the principle of ensuring balance of interest between enterprises and water users
- Equitization in water supply companies is a focus in next years
- Water supply activities should not be limited by administrative borders
- To build up law on water supply and sewerage
- To train and strengthen the central and local government capacity for developing planning, management.
- To promote a privatization into water supply activities of private sectors considering localities
- To strengthen or develop training institutions in the north, in the middle and in the south
- To establish water research institutions, laboratories and water quality monitoring stations in the north, the middle and the south

3.2 HRD System in Urban Water Supply Sector

3.2.1 Retraining and Qualification and Upgrading Training

This survey focuses on in-service training (in here, call retraining) among trainings in water supply sector. Among the retraining, this report defines the training divided into 4 occupational types (pump operator, water treatment plant operator, worker for pipeline installation, water meter reading/ water charge collection) and 7 grades (1-7) qualification as Qualification and Upgrading Training (see next section).

3.2.2 Qualification and Upgrading Training

The systematic in-service training scheme has not been established despite the significance of HRD was pointed out in the old orientation in 1998. However, the Scientific and Technology Board of VWSA discussed the technical standard for skilled workers, and eventually director of Quang Nam WSC finalized it as “Guideline of technical standard for skilled workers in urban water supply sector”. Though the proposal submitted to MOC, they were waiting the completion of a framework of “Law on Education and Vocational Training”. Despite the Law were publicized in 2006, the Qualification and Upgrading Training scheme is still under consideration by MOC with taking a long time.

The guideline proposed by VWSA targets 4 occupations for skilled worker: 1) pump operator, 2) water treatment plant operator, 3) worker for pipeline installation, 4) water meter reading/ water charge collection. Each occupational type is classified into 7 grades depending on required knowledge and skills. Trainees participate in the training courses of target types and grades by training institutions, passing the examination, and can go up to the next grade with a certificate. Skilled workers are required to receive this Qualification and Upgrading Training every 2 years.

However this scheme is still in voluntary base, and not national training scheme. Currently each training institution develops and sets up the training contents and examinations according to the standard guideline, thereby they are not unified. It could be said that systematic training scheme is not developed yet in the country. Meanwhile, Phu Yen WSC modified the standard guideline by them and applied because the guideline is not concrete and practical.

3.2.3 National Training Center (NTC)

The draft new orientation indicates to develop or strengthen training institutions in each north, middle, and south regions. MOC intends not to establish a completely new training institution, but to select one national training center from the existing training institutions in water supply sector. MOC has already chosen College of Urban Works Construction in the north, College of Construction No.2 in the south. MOC recognizes that College of Construction No.3 is not well-functioning; therefore they want to consider other alternative that makes Hue Branch of College of Urban Works Construction as a national training center if the facilities and equipment can be expanded and improved.

These national training centers target not only on in-service training, but also on secondary school and college students in order to develop human resources in urban water supply sector finally.

3.3 Training Institutions for Retraining, and Qualification and Upgrading Training in Urban Water Supply Sector

A list of retraining institutions targeting WSC staffs is shown as below. These institutions are listed up based on the field survey, thus it might not cover all retraining institutions.

Table 3-1 Retraining Institutions

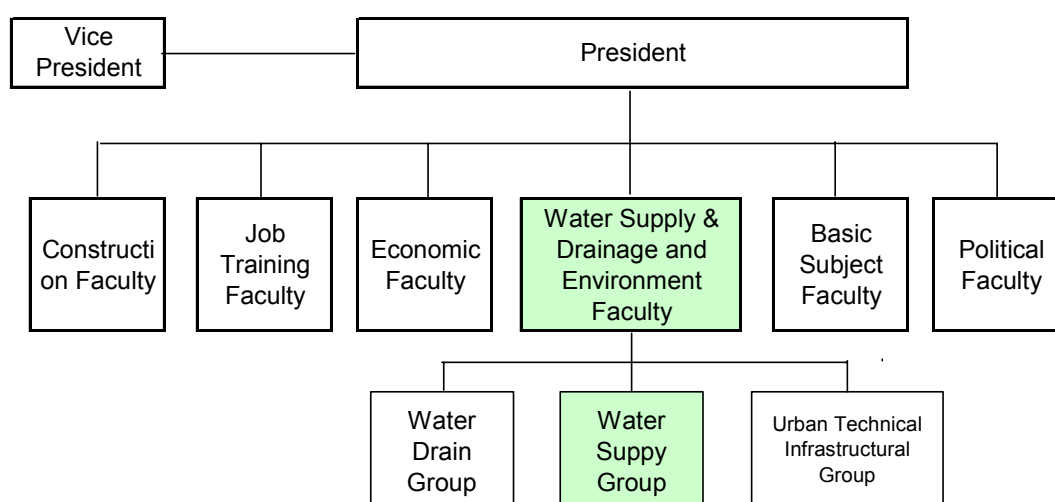
Ministry	Category	Name	Location
MOC	University	University of Architecture	Hanoi
	College	Construction College No.1	Hanoi
		Construction College No.2	HCMC
		Construction College No.3	Phu Yen
		College of Urban Works Construction	Hanoi, Hue
		Western Construction College	Vinh Long
MOE	University	University of Civil Engineering	Hanoi
		HCMC Polytechnical University	HCMC
		HCMC University of Architecture	HCMC

Source: Interview survey

3.3.1 College of Construction No.1

Outline

College of Construction No.1 was established in 1970 under MOC, then approved as college by Decision No 128/1999/QD-TTg (28/5/1999). They have approximately 4,000 students in total. The Water Supply and Sewerage, and Environmental Department with 9 lecturers is responsible for training of water supply sector. Organization Chart is shown as below.



Source: Interview survey

Figure 3-1 College of Construction No.1, Organization Chart

Facilities and Equipment

There are 2 training class rooms for pipeline cutting and installation, laboratory except for class rooms and water quality testing equipment was provided by MOC in 2008. Outside training yard for pipeline installation and water leak detection is not established.

No of Retraining Courses and Course Contents

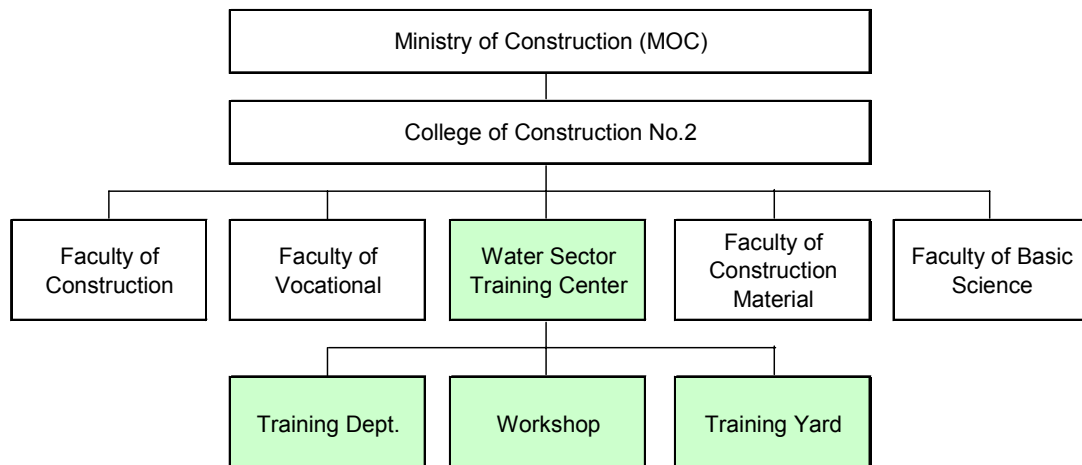
The training course are divided into 3 course such as 3 years, 2 years, 1.5 years courses, however, the training duration for workers, “pipeline installation”, is only limited to 1.5 years. In fact the course duration can be shortened to 6 months, 3 months, 2 months, 1month depending on WSC’s needs. The number of trainees was about 120 people in 2003, however, there are very limited trainees in recently, and then no trainees in 2008.

They prioritize to receive both students and workers equally in their policy, however, the active measures such as training needs survey has not been taken.

3.3.2 College of Construction No.2, WSTC (Water Sector Training Center)

Outline

The College of Construction No.2 is established in 1976 under MOC, and the upgrade to college was approved by Decree No.127/1999/QD-Ttg (28/5/1999). The college consists of 4 departments and WSTC having more than 4,000 students. The college opens water supply and sewerage course (500 students in a grade) for fulltime students and in-service training course. The Organization Chart is shown as below.



Source: Interview survey

Figure 3-2 College of Construction No.2, Organization Chart

Facilities and Equipment

Teaching capacity of the college was developed during 2000-2003 by JICA “Water Sector Training Center Project in the Southern Region”, which provided facilities and equipment such as training yards and leakage detectors and technical supports by the long and short-term Japanese experts. They have also training yard for pipeline installation, for water leakage detection, IT room is equipped with more than 100 computers in addition to ordinary classrooms.

Staffs of Water Sector training Center (WSTC) and Lecturers

WSTC is managed by 11 staffs presently, in which 10 people actually have lessons in training courses. The director of WSTC is also vice-director of the college. WSTC has tried to devise ways to meet demands of training. For instance, new lectures were employed in the IT fields in 2006, who can teach Espanet and Water CAD using software for distribution pipeline network model, because of a progress of IT in management systems of WSCs.

Number of Retraining Course and Course Contents

The technical assistance project implemented by JICA provided 5 courses such as waterworks improvement course, human resource management course, financial and water tariff course, distribution plan course, and non-revenue water prevention course⁴. After that they improved their courses by themselves to meet the training demands, and made an effort on opening new courses. Thereby total number of training courses opened from 2002 to 2008 is 15. The college conducts a high demand course among the total continuously.

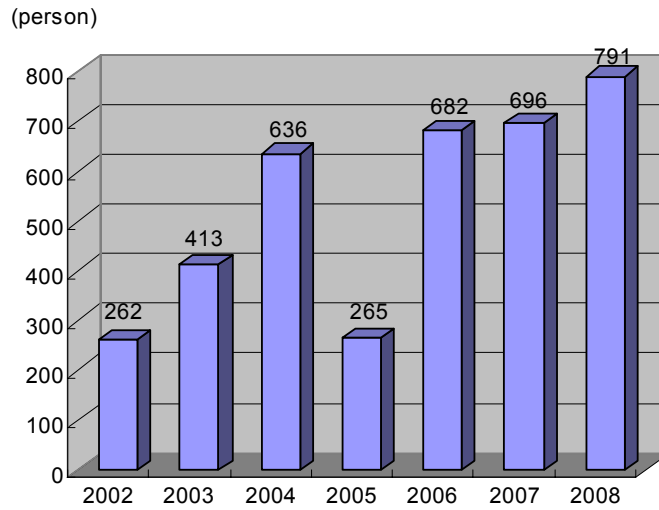
The increasing training needs requires Qualification and Upgrading Training Course, distribution pipeline network model (Espanet, Water CAD) course, water meter management course, non-revenue water prevention course, pipeline installation technique course recently. WSTC can provide various types of courses which are flexible to set up contents and duration of the courses responding to the different training needs and budget by WSCs. In principle the course duration is 1 week or 2 weeks, however, they can adjust it to 3 days course at minimum.

Training course fee is set as 500,000VND/ week regardless of course duration and subjects.

No of Trainees for Qualification and Upgrading Training

Since the college started retraining courses targeting WSC staffs for 2002, the total number of the trainees is 3,745 (as of March 2009). Once they experienced a sudden temporary decrease of number of trainees, the number gradually got increased by the efforts to open new courses to meet the demand, and by enforcing this training in voluntary-base by VWSA. Thereby the number of trainees in 2008 reached at 791 persons, which is equivalent to double of that in 2003, when the technical assistance project terminated.

⁴ JICA(2002) “Evaluation report on the water sector training center project in the socialist republic of Vietnam”



Source: Interview survey

Figure 3-3 College of Construction No.2, a trend of number of retraining trainees

Background of Trainees

The geographical location of trainees is diverse, but mainly from the southern region and some from the middle region. The college conducted a Qualification and Upgrading Training Course in 2008 and 2009 in collaboration with COWASU under the project scheme and also “water CAD” course for outside 28 WSC staffs gathering to COWASU. It enables the college to expand a channel to WSCs in the middle region. In addition, they have an experience to provide a retraining course such as non-revenue water prevention, water treatment technology, water meter reading/ water charge collection for P-CERWASS, a responsible agency for rural water supply.

Main trainees’ WSCs are shown as below.

South region	Dong Nai WSC, Binh Duong WSC, An Giang WSC, Moc Hoa WSC, Long An WSC, Ben Tre WSC, Binh Thuan WSC, Binh Thuan WSC etc
Middle region	Gia Lai WSC, Kon Tum WSC, Dak Lak P-CERWASS etc

Comments

- After the JICA project, the college has tried to improve courses to meet training demands from WSCs and has opened new training courses, while made an effort to conduct need surveys by

themselves. As the results of these efforts, the number of retraining trainees is increasing gradually.

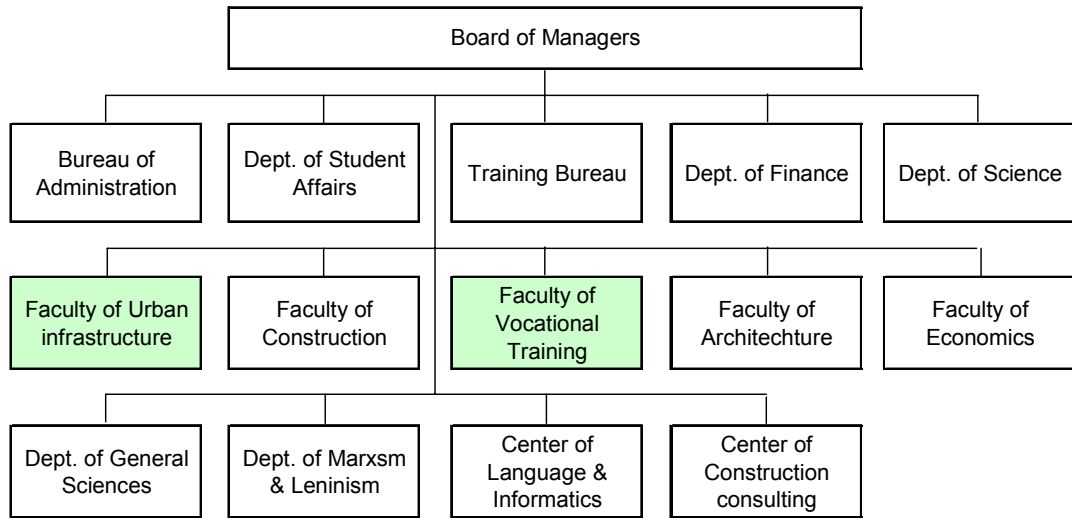
- They have a plan to open training course on O&M of water treatment plant and water quality management to meet the training demands, however, facilities and equipment for the subject are insufficient. The college needs a training small-scale water treatment plant and laboratory and equipment for water quality analysis, such as ones in TCWE of College of Urban Works Construction.
- According to the information from WSTC, the construction cost of the training small-scale water treatment plant (water supply production 500-1000/ m³/day) will be accounted. At the beginning level, necessity to use a small plant in training course is not low. That kind of small plant enables trainees to start and stop the operation of the plant continuously and to obtain operation skill. In fact a training course using a similar plant in TCWE in College of Urban Works Construction is appreciated.

3.3.3 College of Construction No.3

Outline

College of Construction No.3 was established in 1976 under MOC, then approved as a college by Decision No.3069/QD-BGD-DT (21 May 2001) in 2001. They applied an upgrading to university to Ministry of Education currently, and it seemed to be approved according to the information from MOC. In-service training is provided to WSCs located at the coastal areas and highland areas particularly. The total number of teaching staffs came to 167 persons (lecturers 115, management staffs 52).

Organization Chart is shown as below.



Source: Interview survey

Figure3-4 College of Construction No.3, Organization Chart

Facilities and Equipment

2 practical rooms, Pipeline installation yard.

Number of Retraining Course and Course Contents

The college prepares following 3 courses as retraining course targeting WSC’s staff. Every course is for Qualification and Upgrading Training for Skilled Worker according to the guideline proposed by VWSA. The training fee is 1,200,000-1,500,000 VND/ course. This retraining course was started by the request from VWSA.

Course name	Duration
O&M of pumping and water treatment plant course	2 weeks(Grade 6-7)
Distribution pipeline management course	3 weeks(Grade 1-5)
Water meter reading/ water charge collection course	

Background of retraining trainees

Middle region	Phu Yen WSC, Khanh Hoa WSC, Binh Dinh WSC, Ninh Thuan WSC, Kon Tum WSC, Dak Lak WSC, Quang Ngai WSC, Quang nam WSC etc
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No. of Trainees

150 – 200 persons/year

Cooperative Relationship

University of Architecture in Hanoi (Civil engineering, industry, architecture, water supply, infrastructure and urban environment), University of Nha Trang (business accounting), University of Architecture in Ho Chi Minh City etc.

Challenges

The college faces a lack of facilities and equipment, a lack of finance for investment. They have a plan for investment particularly in following areas in future.

- Training and capacity development of their lecturers by foreign experts
- Establishment of laboratory, training yard, and training small-scale water treatment plant
- Research on human resource of WSCs in the middle coastal area and middle highland area.
- Establishment of appropriate training program for water sector (by international organizations)

Observation

They opened only 3 courses for Qualification and Upgrading Training for Skilled Workers currently. They have training yards and a yard for pipeline installation, however, the scale of training yard is small in comparison to College of Construction No.2 and College of Urban Works Construction, and the number of materials and equipment for water supply is limited. The pipelines installed in the training yard seem to be very old with rusting and, some pipes are left at the yard without connected. Therefore it is doubtful how much these yards are utilized in the practical training. The yard does not have leak detection equipment, and they do not conduct the training. According to the information from Phu Yen WSC, it is pointed out that the training is not practical; however, they try to improve that problem by inviting lecturers from Phu Yen WSC with efforts.

The college has not conducted a needs survey for retraining to WSCs. Only in case that they receive a request for training from WSC, a questionnaire survey is implemented in visiting the target WSC. Therefore there is no organizational system to collect training needs by themselves and reflect it to the existing training courses.

3.3.4 College of Urban Works Construction

College of Urban Works Construction was established as a technical secondary school in 1976, and has provided in-service training. In 1997 the school was upgraded to college funded by AFD. AFD extended a loan in the first phase (1997-2006) and DANIDA supplied a loan in the second phase (2006-2008).

Retraining for water supply sector is conducted by Training Center for Water and Environment (TCWE). In-service training for electrician, worker for welding, mason and steel construction in a general civil engineering field are also opened.

Facilities and Equipment

University campus: 2 places (Hanoi:5.1ha,Hue branch:4.0ha)

Laboratory

Small-scale water treatment plant for training: water production about 1000 m³/day, they provide the water after treatment to the neighboring residents

No. of Retraining Course and Course Name

The college prepares about 20 in-service training courses in short-term for water sector. Subjects of the courses are shown as below.

1. Finance and Administration management
2. Customer management
3. Technical management
4. Evaluation on water quality
5. Human Resource Development
6. Supply of maintenance service
7. Research and installation of clean water system
8. Hydraulic and water pump technology
9. Installation of water meter
10. Installation of main pipe and connection pipe made in iron
11. Installation of main pipe and connection pipe made in PVC
12. The necessity and function of filter station in rubber company
13. Check and control the unaccounted-for-water
14. Technology of water treatment station
15. Operation and maintenance of clean water supply system
16. Operation and maintenance of water supply system in rural area
17. Operation skill of water pump

(As of March, 2009)

Staff and Lecturers of TCWE

There are approximately 30 lectures; 18 Vietnamese lecturers (Doctor 1, Master 7, other 10), and 12 foreign lecturers (French 6, Germany 6). They invited outside resources as lecturers such as the vice-director of Hanoi WSCs for project management, and the governmental staffs for financial and waterworks management. Also their permanent lecturers have training experiences in France and Germany.

No. of Trainees on Retraining

The number of trainees in TCWE is indicated as below. This statistics shows the number of trainees after termination of assistance by AFD in April, 2006.

~Apr. 2006	2006	2007	2008	合 計
1,203	319	491	170	2,183

Cooperative Relationships

University of Architecture in Hanoi, overseas colleges and universities (France, Germany, Hong Kong, Morocco, etc.)

Observation

The different points from College of Construction No.2 are to have small-scale training water treatment plant and laboratory in the college. These facilities and equipment enable them to provide more practical courses on O&M of water treatment plant and for water quality management. Also subjects on non-technical field such as HRD, customer management, financial and work management are prepared, thus a comprehensive training courses covering management and technology in waterworks are able to be supplied.

In some cases, some staffs of WSCs study at the college for long-term, but there are no official statistics. Considering the results of the survey holistically, the level of course contents and teaching quality is a bit better than that of College of Construction No.2.

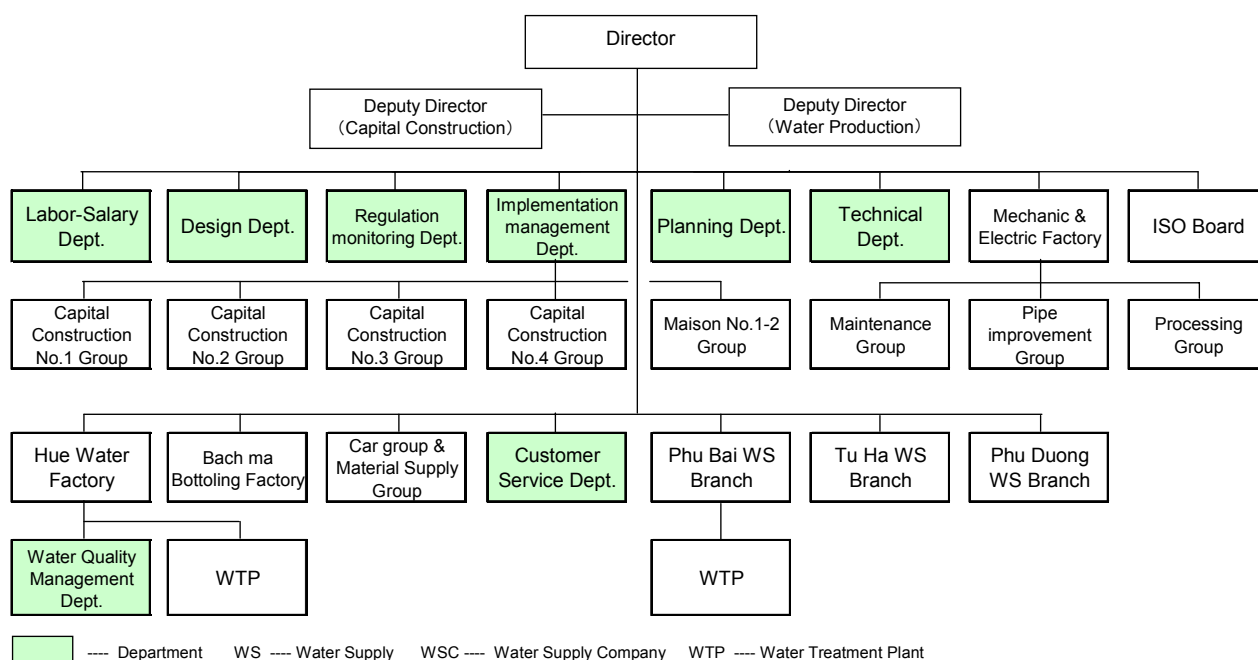
4. COWASU and Comparison to Other WSCs

The waterworks performance of COWASU and other WSCs are shown as below. The information on technical level is described as much as possible based on the survey results in this chapter.

4.1 Current State on COWASU's Waterworks

COWASU is the executing agency of “Technical Assistance Project for HRD in Urban Water Sector in the Middle Regions”, and provides water service to Tua Thien Hue province. Basic statistics are; population served is 0.6 million people, average daily supply amount is 90,000 m³/day, employees are 561 (part-time about 200 people). The project aimed at capacity development of COWASU’s staffs, and provides assistance in the field of water quality management, water distribution network management, HRD and personnel management, and customer service

Organization Chart



Source: Interview survey

Figure 4-1 COWASU Organization Chart

Waterworks Management and Financial Issues

The financial balance of COWASU is positive with 5.5% profit (4.9 billion VND) in 2007 and management state is good. The revenue and expenditure is even with 72.0 billion VND. Remarkably COWASU received 30.0 billion VND as a governmental subsidy.

COWASU already obtained a certificate of ISO9001, and aims at acquiring the ISO14001 and ISO24512⁵ certificates in the next step assisted by ADB.

Human Resource Development

229 skilled workers took examination for Qualification and Upgrading Training in 2007 conducted by the invited lecturers from the College of Construction No.2. 84 staffs on water meter reading/ bill collection were also qualified with practical and paper examinations by COWASU themselves. COWASU ensures 1.59 billion VND for HRD budget in 2009, the positive investment attitude is a remarkable feature in comparison with other WSCs.

Customer service/ Public Relation

A manual for customer relation has been developed, and customer service system has been established to respond quickly to customer's requests/ claims. The annual number of requests/ claims from customers was totally 2,628 in 2008. Public relation activities are active through public magazines for customer, newspaper, mass-media, and social activities such as inviting elementary student's field trips to water treatment plant and holding a drawing contest.

O&M of Water Facilities and Technical Level

Non-revenue water ratio recorded 15% as the lowest level in the country. COWASU already obtained ISO/IEC17025 certificate and analyzes 29 parameters in water quality, and monitors water pressure and residual chlorine at 126 places in the distribution network. As the result, COWASU declared "safety drinking water" to Hue citizens for the first time in the country in June 2008, and plans to declare also to the Thua Thien Hue province in June 2009. Meanwhile currently 6 technical manuals and handbooks are prepared and utilized for internal training for HRD. The summary table on the water utility is shown as following.

⁵ A standard for management of water supply activity and evaluation of water supply service certified by International Standard Organization.

Table 4-1 Summary Table on the Water Utility

Thua Thien Hue Water Supply State-one Member Limited Company (COWASU)			
Basic Information			
Address:	Hue City		
Year established:	1909		
No of Employee:	561 employees (Full-time 361, Part-time about 200)		
Business activity excluding water supply:	Manufacturing and sales of mineral water bottle		
Target service area	Tua Thien Hue Province		
Total population in service area(mil people):	1.2		
Served population(mil people) :	0.6		
Served population rate:	50%		
Target served population rate up to 2020:	85-90%		
Management and Financial indicator		Customer relation/ Customer service	
Total WSC's revenue	VND	Dept. of Customer Relation/ Customer Service	0
Total WSC's expenditure	VND	Manual for Customer Relation/ Service	0
Revenue from water supply works	72.0 billion VND	Record on responses to customer's request	0
Expenditure from water supply works	72.0 billion VND	No of responses to customer's request	2,628
Working Ratio (Water sales/Water operating cost)	1.00	No of Public Relation activity	9
Governmental subsidy(bil VND)	30	No of PR materials	11
Water tariff collection rate	97-98%	Needs Survey/ Customer Satisfaction Survey	2007, 2008
Water tariff			
General household	2,500VND/m ³		
Office/ manufacture	4,620VND/m ³		
Service	6,750VND/m ³		
ISO 9001	0		
Human Resource Development		O&M and technical level of Water Supply Utilities	
HRD plan/ program	0	No of connection	97,000
Annual budget for HRD	1.59 bil VND	Average daily supply amount(m3)	75,000-90,000
Qualification/Upgrading test		water supply service hours(h)	24h
No of staff taking test (person)	323	Total length of pipeline(km)	1,700km
No of annual participants in training course (total)	896	Uncounted for Water(UFW)	15%
management staff (person)	599	Water Safety Plan (WSP)	0
technical staff (person)	297	No of Water Quality parameters checked	29
training seminar by themselves/ No of workshop	12	Frequency of checking turbidity, pH, residual chlorine	everyday
No of training manual/ handbook	7	ISO/IEC 17025	0
Outside training institutions		Decralation of Safety Water	0
- College of Construction No.2		Record on O&M	0
		No of manual/ handbook	6

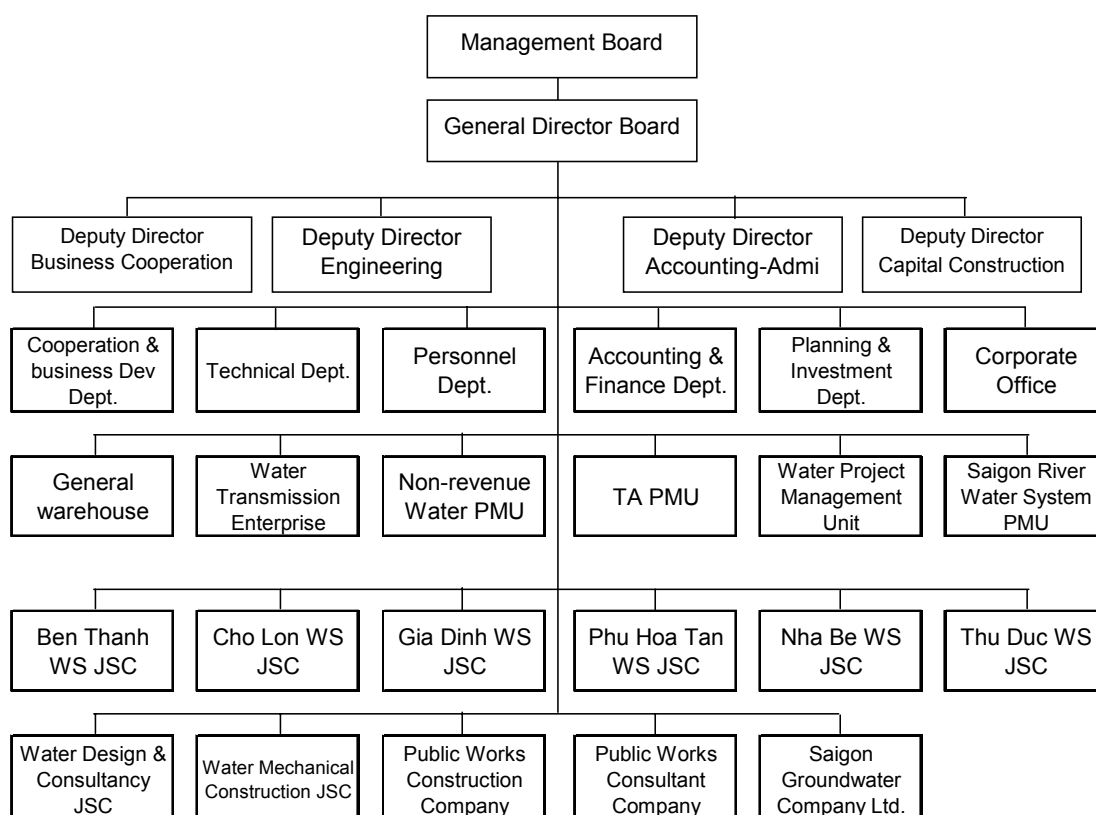
Source: Interview survey

4.2 Current State on Saigon WSC (SAWACO) Waterworks

SAWACO provides water supply service to the area of all Ho Chi Minh City. Population served is about 5.2 million people, average daily supply amount is 1.25 million m³/day, the number of employees is 3,500 in total, and the scale could be in the top class. In comparison to COWASU, the scale is 4 times larger in population served, 14 times bigger in average daily supply amount, 6 times more in the number of employees. SAWACO itself is a state-owned holding company which has 8 subsidiary companies, of which 6 are joint stock companies. The composition of shares of mother company is 51% by state, 49% by private sector (bank 10%, individual, WSC staffs, etc.); about a half of shares is held by private stakeholders. Also SAWACO purchases 1.5% of total amount of supplying water from private companies.

Main customers are general households 68%, commerce 14%, industry 8%, and other 10%.

Organization Chart



Source: Interview survey

Figure 4-2 SAWACO Organization Chart

Waterworks Management and Financial Issues

The total revenue is gradually increasing reaching at 1052.6 billion VND, which is 11 times that of COWASU. However, the financial balance on waterworks is negative with minus 70 billion VND, receiving 252.6 billion VND as a governmental subsidy. Bill collection ratio is 99.5% at high level.

Currently ISO9001 is in progress for being acquired.

Human Resource Development

About 8% of staffs participate in in-service training at outside training institutions in 2008. A number of internal training seminars/ workshops and a number of training textbooks are prepared. If financial resource is found, they plan to establish a training center by themselves.

Customer Service/ Public Relation

The number of responses to customer request/ claims records about 32,000. They have a department of customer management and service, however, not a response manual. Public relation activities and the number of public relation materials are limited. They set up a postbox in the office and try to collect customer's voice, but they do not reach at the so high level as to conduct customer needs survey/ customer satisfaction survey.

O&M of Water Facilities and Technical Level

43% Non-Revenue Water ratio is remarkably low level. They dispatched staffs to COWASU aiming to attend training on reduction of non-revenue water. 17 water quality parameters are analyzed, and a progress of WSP is at Step 4. They plan to declare "safety drinking water" by 2025. Reduction of non-revenue water and water quality management are crucial future challenges.

SAWACO outsourced an implementation of a plan for reduction of non-revenue water to Manila Water Company for 5 years at a cost of about 1,500 US\$.

The summary table on the water utility is shown as following.

Table 4-2 Summary Table on the Water Utility

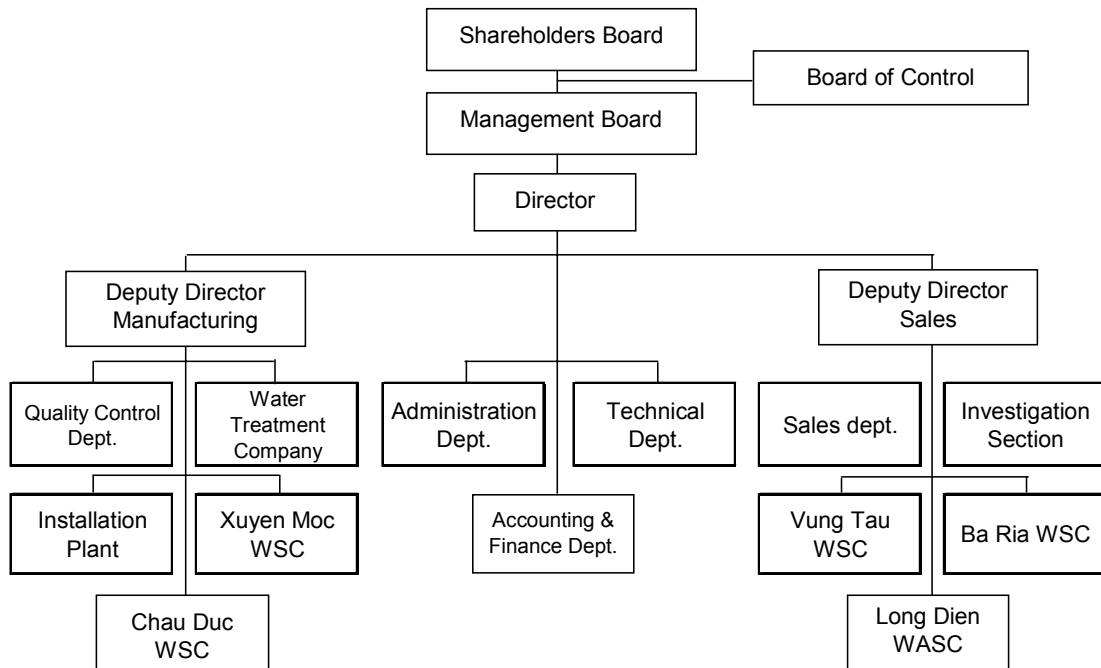
Saigon Water Corporation (SAWACO)			
Basic Information			
Address:	Ho Chi Minh City		
Year established:	1874		
No of Employee:	3639 employees (Full-time NA, Part-time NA)		
Business activity excluding water supply:	Consulting service, Survey on water meter, Construction		
Target service area	All Ho Chi Minh City		
Total population in service area(mil people):	627		
Served population (mil people) :	509		
Served population rate:	82%		
Target served population rate up to 2020 :	100%		
Management and Financial indicator		Customer relation/ Customer service	
Total WSC's revenue	1052.6 billion VND	Dept. of Customer Relation/ Customer Service	○
Total WSC's expenditure	1014.5 billion VND	Manual for Customer Relation/ Service	×
Revenue from water supply works	898.6 billion VND	Record on responses to customer's request	○
Expenditure from water supply works	969.3 billion VND	No of responses to customer's request	32000
Working Ratio (Water sales/Water operating cost)	0.93	No of Public Relation activity	3
Governmental subsidy (bil VND)	252.6 billion VND	No of PR materials	2
Water tariff collection rate	99.5%	Needs Survey/ Customer Satisfaction Survey	×
Water tariff		※Putting Post Box	
General household	2700VND/m ³		
Manufacturing	4500VND/m ³		
Office	6000VND/m ³		
Service	8000VND/m ³		
ISO9001	△		
Human Resource Development		O&M and technical level of Water Supply Utilities	
HRD plan/ program	○	No of connection	688,124
Annual budget for HRD	0.5 billion VND	Average daily supply amount(m3)	1,245,426
Qualification/Upgrading test		water supply service hours(h)	24h
No of staff taking test(person)	431(2007), 102(2008)	Total length of pipeline(km)	3705km
No of annual participants in training course (total)	500(2007), 305 (2008)	Uncounted for Water(UFW)	43%
training seminar by themselves/ No of workshop	NA	Water Safety Plan(WSP)	△(step 4)
No of training manual/ handbook	4	No of Water Quality parameters checker	17
Outside training institutions		Frequency of checking turbidity, pH, residual chlorine	everyday
- College of Construction No2		ISO/IEC 17025	×
- College of Urban Works Construction		Decralation of Safety Water	×
- University of Polytechnic		Record on O&M	○
etc		No of manual/ handbook	△

Source: Interview survey

4.3 Current State on Baria Vuntao WSC's Waterworks

Baria Vuntao WSC provides water supply service to the area of all Baria Vuntao City. Population served is about 1.04 million, average daily supply amount is 115,000 m³/day, and the number of employees is 390 people. In comparison to COWASU, the scale is 1.7 times bigger in population served, 1.3 times larger in average daily supply amount, 1.1 times more in the number of employees. Baria Vuntao WSC itself is one of 3 joint stock companies in the country. The composition of shares is 65% by state, 35% by private sector (aluminum company, chemical manufacturing company, individual, WSC staffs, etc.), and they will reduce the state share to 53% in 2009.

Organization Chart



Source: Interview survey

Figure 4-3 Baria Vuntao WSC Organization Chart

Waterworks Management and Financial Issues

Financial balance on waterworks is positive with 11% profit and the profitability is high, and enough to recover the cost for O&M of facilities. Billing ratio is almost 100%. ISO 9001 certificate was already obtained. Therefore their performance in this aspect is good.

Human Resource Development

65% of staffs have participated in any trainings, and a number of internal seminar/ workshops are sufficient with positive attitude. However, the amount of investment for HRD was 770,000VND, one-fifth of that of COWASU.

They send staffs to College of Construction No.2, College of Urban Works Construction, and PACE for retraining. The staffs studied general waterworks, O&M of water treatment plant and for pumping, pipeline installation and O&M in College of Urban Works Construction, and business for management staffs in PACE.

Customer Service/ Public Relation

The responsible section for customer response is located in sales department, and surveys on customer needs / customer satisfaction were conducted in the recent 2 years, 2007 and 2008. Meanwhile, public relation materials are not developed and the activities are not sufficiently implemented.

O&M of Water Facilities and Technical Level

Non-revenue water ratio is less than 15%, similar to COWASU, and shows a good performance. Baria Vuntao WSC has a testing system for water quality and 20 parameters for water quality are analyzed by 7 staffs using their own equipment. The progress of WSP is at Step3 - 4 and in progress. They installed GIS, but not installed the software for distribution network management to monitor water pressure and water flow, which is expected to be obtained in future.

The summary table on the water utility is shown as following.

Table 4-3 Summary Table on the Water Utility

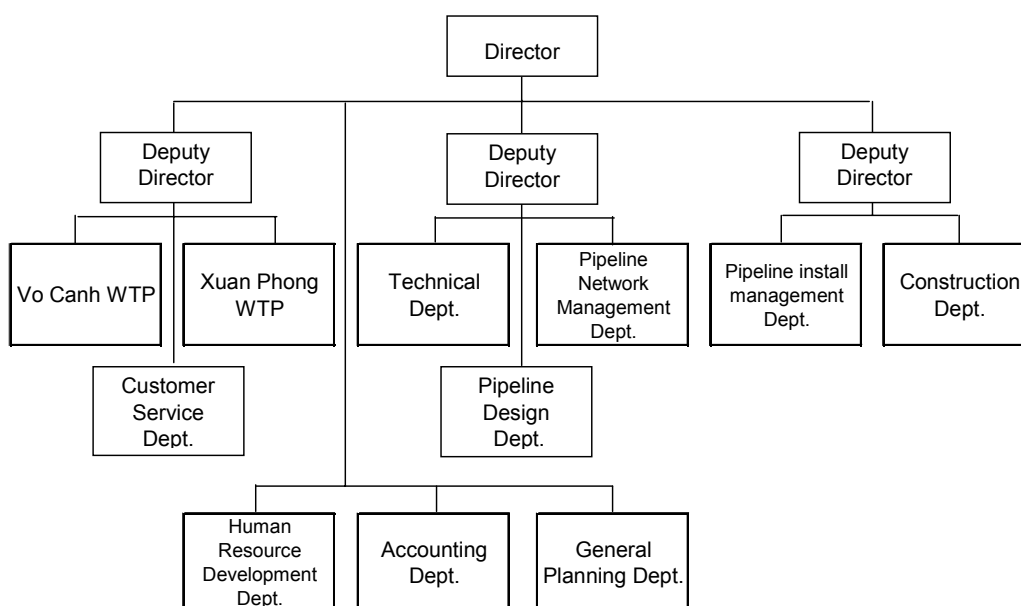
Baria-Vuntao Water Supply Joint Stock Company(BWACO)			
Basic Information			
Address:	Baria Vuntao City		
Year established:	1982		
No of Employee:	390 employees (Full-time NA, Part-time NA)		
Business activity excluding water supply:	Consulting service, ice manufacturing, Trading materials and equipment		
Target service area			
Total population in service area(mil people):	116		
Served population (mil people) :	104		
Served population rate:	89.5%		
Target served population rate up to 2020:	100%		
Management and Financial indicator		Customer relation/ Customer service	
Total WSC's revenue	NA	Dept. of Customer Relation/ Customer Service	○
Total WSC's expenditure	NA	Manual for Customer Relation/ Service	×
Revenue from water supply works	139.1 billion VND	Record on responses to customer's request	○
Expenditure from water supply works	122.9 billion VND	No of responses to customer's request	6125
Working Ratio (Water sales/Water operating cost)	1.13	No of Public Relation activity	1
Governmental subsidy (bil VND)	0	No of PR materials	0
Water tariff collection rate	almost 100%	Needs Survey/ Customer Satisfaction Survey	2007, 2008
Water tariff			
General household	2500-4000VND/m ³		
Office/ manufacturing	6000VND/m ³		
Service	8000VND/m ³		
ISO9001	○		
Human Resource Development		O&M and technical level of Water Supply Utilities	
HRD plan/ program	○	No of connection	85,933
Annual budget for HRD	0.3 billion VND	Average daily supply amount(m ³)	115,000
Qualification/Upgrading test		water supply service hours(h)	24h
No of staff taking test(person)	100 (2007)	Total length of pipeline(km)	500km(D ≥ 100)
No of annual participants in training course (total)	250	Uncounted for Water(UFW)	<15%
training seminar by themselves/ No of workshop	187	Water Safety Plan (WSP)	△ (step3-4)
No of training manual/ handbook	5	No of Water Quality parameters checked	20
Outside training institutions		Frequency of checking turbidity, pH, residual chlorine	everyday
- College of Construction No2		ISO/IEC 17025	×
- College of Urban Works Construction		Decralation of Safety Water	×
- PACE(Private)		Record on O&M	○
		No of manual/ handbook	6

Source: Interview survey

4.4 Current State on Khanh Hoa WSC's Waterworks

Khanh Hoa WSC provides water supply service to the area of Nha Trang City and the neighboring districts. Population served is about 430,000 million people, average daily supply amount is 70,000 m³/day, and the number of employees is 315 people. In comparison to COWASU, the scale is 70% in population served, 75% in average daily supply amount, 85% in the number of employee. Khanh Hoa WSC itself is a state-owned company, and is planed to be privatized to a joint stock company in 2009. After the transition, the composition of shares will be state 51%, private sector 49% (private company, individual, WSC staffs, etc.).

Organization Chart



Source: interview survey

Figure 4-4 Khanh Hoa WSC Organization Chart

Waterworks Management and Financial Issues

The financial balance on waterworks is positive with 18% profit. However, as receiving 59.0 billion VND government subsidy in 2008, their balance cannot recover the cost. On the other hand, it is remarkable that the water tariff is the lowest in the country. As they received a loan for expansion of Vo Camh Water Treatment Plant from ADB in 2003, the loan influences their financial management.

Human Resource Development

The number of trainees is low level; 16 staffs were trained by Qualification and Upgrading Training, and 13 by retraining courses at outside training institutions. Because WSC supports only half of the training fee, staffs have to pay the remaining the half. The budget on HRD is not sufficiently ensured in real situation.

Customer Service/ Public Relation

Department of customer service is independent, so the system for taking care of customers might be developed at least. Their main tasks are to check customer's violation of breaking contracts, such as illegal tricks on distribution pipeline or water meter etc, and to charge a penalty for the violation if necessary. Meanwhile, a manual for customer response is not developed, and surveys on customer needs/ customer satisfaction have not been implemented. Also they face a difficulty that the capacity of database for customer management is not sufficient.

O&M of Water Facilities and Technical Level

Non-revenue water ratio is relatively low at 22%. 15 parameters for water quality are analyzed. They just started an action for establishing WSP and in Step1. GIS is not installed, and hand written drawings are still utilized at present.

The summary table on the water utility is shown as following.

Table 4-4 Summary Table on the Water Utility

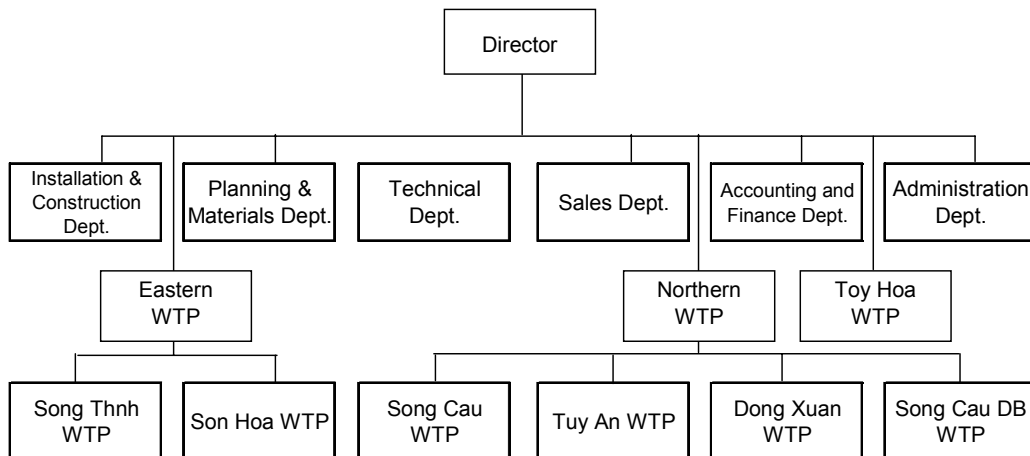
Khanh Hoa Water Supply and Sewerage Company (KAWASCO)			
Basic Information			
Address:	Nha Trang City		
Year established:	1979		
No of Employee:	315 employees (Full-time 241, Part-time 74)		
Business activity excluding water supply:	Sewerage service, Consulting/ design, Construction of digestion tank		
Target service area	Nha Trang City, Neighboring District town		
Total population in service area(mil people):	43.4		
Served population (mil people) :	38.2		
Served population rate:	88%		
Target served population rate up to 2020:	99%		
Management and Financial indicator		Customer relation/ Customer service	
Total WSC's revenue	NA	Dept. of Customer Relation/ Customer Service	○
Total WSC's expenditure	NA	Manual for Customer Relation/ Service	×
Revenue from water supply works	63.3 billion VND	Record on responses to customer's request	○
Expenditure from water supply works	51.9 billion VND	No of responses to customer's request	243
Working Ratio (Water sales/Water operating cost)	1.22	No of Public Relation activity	0
Governmental subsidy (bil VND)	59.0 billion VND	No of PR materials	0
Water tariff collection rate	90%	Needs Survey/ Customer Satisfaction Survey	×
Water tariff			
General household	2300VND/m ³		
Office	3000VND/m ³		
Manufacturing	4500VND/m ³		
Service	6900VND/m ³		
ISO9001	×		
Human Resource Development		O&M and technical level of Water Supply Utilities	
HRD plan/ program	×	No of connection	74,000
Annual budget for HRD	0.1 billion VND	Average daily supply amount(m3)	70,000
Qualification/Upgrading test		water supply service hours(h)	24h
No of staff taking test(person)	16	Total length of pipeline(km)	750km
No of annual participants in training course (total)	29	Uncounted for Water(UFW)	22%
training seminar by themselves/ No of workshop	NA	Water Safety Plan (WSP)	△ (Step 1)
No of training manual/ handbook	0	No of Water Quality parameters checked	15
Outside training institutions		Frequency of checking turbidity, pH, residual chlorine	everyday
- College of Construction No2		ISO/IEC 17025	×
- College of Construction No3		Decralation of Safety Water	×
- College of Urban Works Construction		Record on O&M	△
- University of Economy(HCMC)		No of manual/ handbook	0
- University of Nha Trang			
※Training fee is borne by WSC's staff (50%) and WSC (50%)			

Source: Interview survey

4.5 Current State on Phu Yen WSC's Waterworks

Phu Yen WSC provides water supply service to the area of Phu Yen province. Population served is about 118,000 million, average daily supply amount is 22,000 m³/day, the number of employees 165. In comparison to COWASU, the scale is 20% in population served, 25% in average daily supply amount, 45% in the number of employees, and the scale may be one-third of COWASU. Phu Yen WSC itself is a state one member company, and not joint stock company. At least, they want to keep this organization type up to 2010.

Organization Chart



Source: Interview survey

Figure 4-5 Phu Yen WSC Organization Chart

Waterworks Management and Financial Issues

The financial balance on total business is positive with 6.5% profit, and the balance on waterworks is not available. Billing collection ratio is 95% and ISO9001 is certified, therefore their performance in this aspect is relatively good.

Human Resource Development

49 staffs (29%) participated in Qualification and Upgrading Training in 2008, and the number of trained staffs including the above number accounts for about 80%. Off-the-job-trainings on O&M

of water treatment plant, and of customer service are implemented, and their attitude on HRD is active.

Customer Service/ Public Relation

A vision on quality management policy of Phu Yen WSC is customer first; and to realize it, their task is set for improvement of volume, pressure and quality of supplying water and customer service.

Department of sales has the section which takes charge customer service. 5-10 public relation activities are implemented annually, and the materials are prepared. Explanatory meetings to customers are organized and the performance is relatively advanced.

O&M of Water Facilities and Technical Level

Non-revenue water ratio is 24-30% as mostly average. 14 parameters for water quality are analyzed. They organized a team for establishing WSP and the progress is in Step 3-4. They are willing to work for ISO/IEC17025 and declaration of “safety drinking water” very much, and set 2010 as the target year.

It is remarkable that water meter readers are trained to input the value data into database in a computer by themselves.

The summary table on the water utility is shown as following.

Table 4-5 Summary Table on the Water Utility

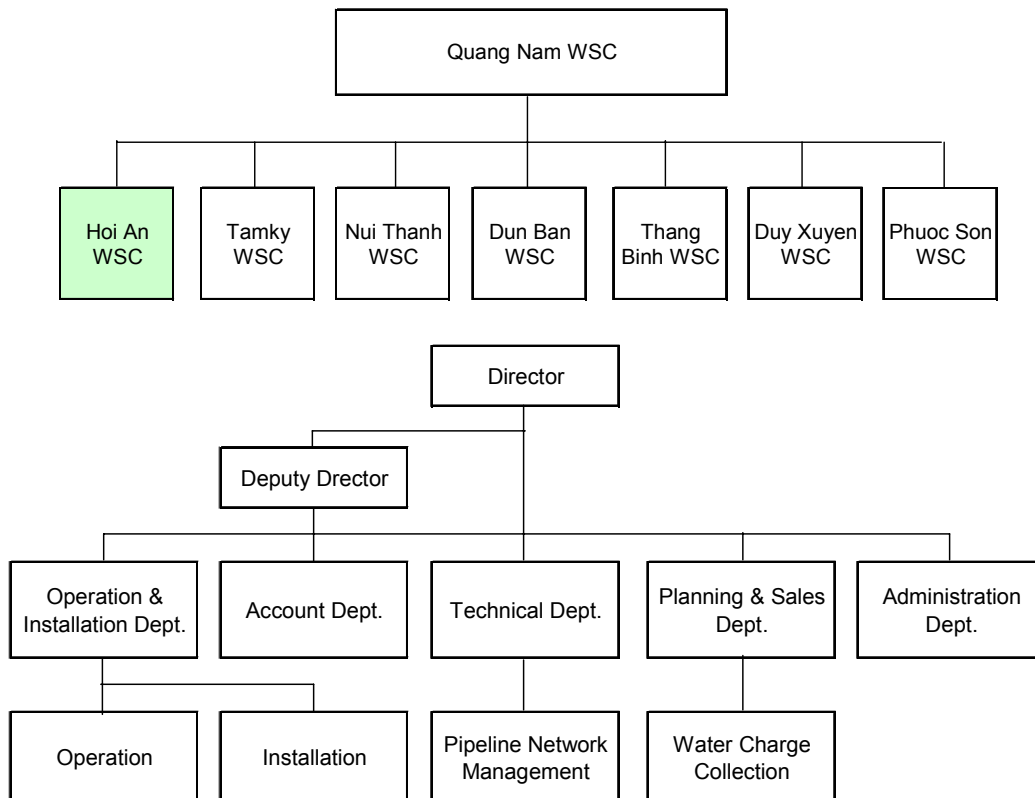
Phu Yen Water Supply and Sewerage State-one member Limited Company			
Basic information			
Address:	Phu Yen City		
Year established:	1996		
No of Employee:	169 employees (Full-time NA, Part-time NA)		
Business activity excluding water supply:	Sewerage service, Consulting/design, Trading of materials and equipment		
Target service area	All Phu Yen Province		
Total population in service area(mil people):	19.6		
Served population (mil people) :	11.8		
Served population rate:	60%		
Target served population rate up to 2020:	80-95%		
Management and Financial indicator		Customer relation/ Customer service	
Total WSC's revenue	17.3 billion VND	Dept. of Customer Relation/ Customer Service	○
Total WSC's expenditure	16.2 billion VND	Manual for Customer Relation/ Service	○
Revenue from water supply works	NA	Record on responses to customer's request	○
Expenditure from water supply works	NA	No of responses to customer's request	60/month
Working Ratio (Water sales/Water operating cost)	1.07	No of Public Relation activity	5-10
Governmental subsidy (bil VND)	0	No of PR materials	6-12
Water tariff collection rate	95%	Needs Survey/ Customer Satisfaction Survey	○
Water tariff			
General household	2500VND/m ³		
Office	3000VND/m ³		
Manufacturing	4000VND/m ³		
Service	5000VND/m ³		
ISO9001	○		
Human Resource Development		O&M and technical level of Water Supply Utilities	
HRD plan/ program	△	No of connection	23,500
Annual budget for HRD	0.15 billion VND	Average daily supply amount(m ³)	22,000
Qualification/Upgrading test		water supply service hours(h)	24h
No of staff taking test (person)	49(2008)	Total length of pipeline(km)	202km
No of annual participants in training course (total)	135(80%)	Uncounted for Water(UFW)	24-30%
training seminar by themselves/ No of workshop	NA	Water Safety Plan(WSP)	△ (Step3-4)
No of training manual/ handbook	6	No of Water Quality parameters checked	14
Outside training institutions		Frequency of checking turbidity, pH, residual chlorine	everyday
- College of Construction No2		ISO/IEC 17025	×
- College of Construction No3		Decralation of Safety Water	×
- Polytechnic University (Phu Yen)		Record on O&M	○
		No of manual/ handbook	6

Source: Interview survey

4.6 Current State on Hoi An WSC's Waterworks

Hoi An WSC provides water supply service to the all area of Hoi An City in Quang Nam province. Population served is about 17,000 million, average daily supply amount is 4,500 m³/day, and the number of employees 50. In comparison to COWASU, the scale is 3% in population served, 5% in average daily supply amount, 9% in the number of employees, and the scale may be less than one-tenth of COWASU. Hoi An WSC itself is a state one member company, and not joint stock company.

Organization Chart



Source: interview survey

Figure 4-6 Quang Nam WSC and Hoi An WSC Organization Chart

Waterworks Management and Financial Issues

The financial balance of total activities is positive with 6.5% profit. Bill collection ratio is nearly 100% in urban area but in rural area staying 90% at low level; and whole average is 95%. As working for ISO9001 is currently in progress, it expected to be obtained in 2009.

Human Resource Development

16 staffs (32%) participated in Qualification and Upgrading Training in 2008, and the number of trained staffs including the above is 24 (48%). They utilize College of Urban Works Construction, College of Construction No.2 etc as retraining institutions, and 2 staffs are studying at College of Urban Works Construction during 2006-2009. The half of training fee is burdened by the WSC and the other half by staff in long term training. In case of short term, the WSC pays course fee and staff pays transportation and accommodation fee. In 2009, Hoi An WSC plans to send 10 staffs to Qualification and Upgrading Training for skilled workers to Quang Nam mother company.

Customer Service/ Public Relation

They do not have a particular section for customer service. Annual number of customer request/claims is counted for 10, and survey on customer needs or customer satisfaction has not been implemented. Public relation activity is limited only to the website. Their human resource is constrained and their performance in this aspect is low.

O&M of Water Facilities and Technical Level

Non-revenue water ratio is 28% and the number of parameters for water quality is 12. Only 3 parameters such as turbidity, pH, and residual chlorine are checked everyday. The other parameters are analyzed in medical center in Quang Nam province. The progress of WSP is just starting at Step 1. Record of daily O&M of water treatment plant and water quality analysis is taken in notebooks by hand writing.

The summary table on the water utility is shown as following.

Table 4-6 Summary Table on the Water Utility

Hoi An Water Draining and Construction Company			
Basic Information			
Address:	Hoi An City		
Year established:	1985		
No of Employee:	50 employees (Full-time 50 , Part-time when installing new pipeline)		
Business activity excluding water supply:	Sewerage Service, Design and Consulting service		
Target service area	All Hoi An City		
Total population in service area(mil people):	8.1		
Served population(mil people) :	1.7		
Served population rate:	20%		
Target served population rateup to 2020:	70%		
Waterworks Management and Financial indicator		Customer relation/ Customer service	
Total WSC's revenue	NA	Dept. of Customer Relation/ Customer Service	×
Total WSC's expenditure	NA	Manual for Customer Relation/ Service	×
Revenue from water supply works	6.0 billion VND	Record on responses to customer's request	○
Expenditure from water supply works	5.3 billion VND	No of responses to customer's request	10
Working Ratio (Water sales/Water operating cost)	1.13	No of Public Relation activity	0
Governmental subsidy(bil VND)	0	No of PR materials	1
Water tariff collection rate	95%	Needs Survey/ Customer Satisfaction Survey	×
Water tariff			
Household	3300VND/m ³		
Office	4700VND/m ³		
Manufacture	5400VND/m ³		
Service	6500VND/m ³		
ISO9001	△(2009 expected)		
Human Resource Development		O&M and technical level of Water Supply Utilities	
HRD plan/ program	×	No of connection	2,350
Annual budget for HRD	10 million VND	Average daily supply amount(m ³)	4,500
Qualification/Upgrading test		water supply service hours(h)	24h
No of staff taking test(person)	0	Total length of pipeline(km)	74km
No of annual participants in training course (total)	8	Uncounted for Water(UFW)	28%
Training seminar by themselves/ No of workshop	0	Water Safety Plan (WSP)	×
No of training manual/ handbook	0	No of Water Quality parameters checked	12
Off-the-Job- Training institutions		Frequency of checking turbidity, pH, residual chlorine	everyday
- College of Urban Works Construction		ISO/IEC 17025	×
- College of Construction No2		Decralation of Safety Water	×
※Training fee is borne by WSC's staff (50%) and WSC (50%)		Record on O&M	○
		No of manual/ handbook	0

Source: Interview survey

4.7 Comparison of WSC Performances and Evaluation

Based on information by interview surveys, the following description shows comparison among WSCs on 17 main performance indicators of various aspects; such as management and finance, human resource development, customer service and public relation, operation and maintenance, and technical level.

The comparison table of WSC's performance is shown as below.

Table 4-7 Comparison of Performances among WSCs

Items	Thua Thien Hue WSC (COWASU)	Saigon WSC (SAWACO)	Baria-Vuntau WSC (BWACO)	Khanh Hoa WSC (KAWASCO)	Phu Yen WSC	Hoi An WSC	
A General information							
1 Organization Type	State one member	State-owned	Joint stock	State-owned	State one member	State-owned	
2 Number of Employees (permanent)*	361	3639	390	241	169	50	
3 Average Daily Supply Amount (m3)	75,000 - 90,000	1,245,426	115,000	70,000	22,000	4,500	
4 Population in responsible area	1,200,000	6,273,968	1,156,600	434,000	196,000	81,000	
5 Population served	600,000	5,088,831	1,036,150	381,896	117,500	16,500	
6 No of connection	97,000	688,124	85,933	74,000	23,500	2,350	
7 Governmental subsidies (VND)	30 bil.	253 bil.	0	59 bil.	0	0	
B Evaluation Indicators							
Management/ Financial Issues	1 Staff/ 1000 Connections*	3.7	5.3	4.5	3.3	7.2	21.3
	2 Operating Cost Coverage (Revenue/ Expenditure)	1.00	0.93	1.13	1.22	1.07	1.13
	3 Bill Collection Rate	97.5%	99.5%	≈100%	90.0%	95.0%	95.0%
	4 Domestic Water Tariff / m3	VND 2,500	VND 2,700	VND 3,750	VND 2,300	VND 2,500	VND 3,300
	5 Affordability of Basic Water Tariff	0.48%	0.18%	0.48%	0.38%	0.48%	0.72%
	6 ISO 9001	○	△	○	×	○	△
Technical Level	7 Water Loss Rate (Unaccounted for Water Rate)	15.0%	43.0%	<15%	22.0%	27.0%	28.0%
	8 Water Safety Plan (WSP)	○	△(Step 4)	△(Step 3-4)	△(Step 1)	△(Step 3-4)	△(Step 1)
	9 No of Analyzing Water Quality Parameters	29	17	20	15	14	12
	10 ISO/IEC 17025	○	×	×	×	×	×
HRD	11 Qualification/ Upgrading Training Participation Ratio (% staff)	63%	6%	26%	7%	29%	0%
	12 Off-the-Job-Training participation ratio (% staff)	87%	11%	64%	12%	80%	16%
	13 No of Training Textbooks / Manuals developed by WSC	7	4	5	0	6	0
	14 Annual Investment in Staff Training (VND/ staff)	VND 4,376,731	VND 137,400	VND 769,231	VND 414,938	VND 887,574	VND 1,000,000
Customer/ PR	15 Customer's Complaints/ 1000 Connections	27.1	46.5	71.3	3.3	30.6	4.3
	16 Customer Needs/ Satisfaction Survey	○	×	○	×	○	×
	17 No of Public Relation Materials	11	2	0	0	6-12	1

Source: Interview survey

4.7.1 Staff/ 1000 Connections

This is one of indicators which measure the efficiency of waterworks management. The fewer the staff/ 1000 connections is, the better the waterworks management could be. The number of permanent staff is accounted in this calculation.

The result of COWASU is 3.7 person/ 1000 connections, which is the second good performance behind Khanh Hoa WSC. Hoi An WSC showed the largest number of staffs/ 1000 connections as 21.3 persons, much higher than results of the other WSCs. If the calculation considers the number of non-permanent staff in case of COWASU and Khanh Hoa WSC, the results come 5.8 persons and 4.3 persons respectively.

4.7.2 Operating Cost Coverage

This is one of indicators which measure profitability of water supply activity, and is obtained by dividing revenue by expenditure. If the value exceeds 1.0, it is regard that cost could be recovered.

The operating cost coverage of COWASU is 1.0, which means both revenue and expenditure are same as 7.2 billion VND. Total financial balance of COWASU including other business activities is positive with 6.6% (pre-tax). The highest profitability is indicated by Khanh Hoa WSC as 1.22. However, it is necessary to consider other factor that Khanh Hoa WSC receives governmental subsidy mostly same amount as revenue of water supply works, the total financial balance of Khanh Hoa WSC turns bad. Except for Khanh Hoa WSC, Baria Vuntao WSC and Hoi An WSC indicate the best profitability as 1.13.

4.7.3 Bill Collection Ratio

This indicator shows water bill collection ratio from customer. If the water tariff collection ratio is close to 100%, it means that WSC collects payment without loss.

The collection ratio of COWASU recorded high score as 97.5%, after Baria Vuntao WSC as 100% and SAWACO as 99.5%. In case of Khanh Hoa WSC, the collection ratio was 90%, lower than the national average.

4.7.4 Tariff for Domestic Use (VND/ m³)

In terms of basic water tariff for domestic users, Khanh Hoa WSC set the lowest price at 2,300 VND/ m³, and the second lowest price is 2,500 VND/ m³ by COWASU and Phu Yen WSC. Meanwhile, the most expensive price is 3,750 VND/ m³ by Baria Vuntao WSC.

4.7.5 Affordability of Basic Water Tariff (VND/ m³)

This indicator is calculated by dividing basic water tariff for domestic use by GDP per capita, indicating affordability to pay. The previous indicator does not consider the level of the price from the view of household income, thus this indicator utilizes data of GDP per capita and examines the affordability to pay.

The lowest level of water tariff against household income is set by SAWACO as 0.18%. The next place is Khanh Hoa WSC with 0.38%, COWASU, Baria Vuntao WSC, Phu Yen WSC with 0.48%. Hoi An WSC set much higher level of water tariff, 7.2%, in the ratio to household income level.

4.7.6 ISO9001

Only 3 WSCs such as COWASU, Baria Vuntao WSC, Phu Yen WSC obtained ISO9001 certificates. SAWACO and Hoi An WSC is undertaking the process of obtaining ISO 9001.

4.7.7 Uncounted for Water

This indicates a ratio of water loss from production at water treatment plant to end users; the lower ratio means the less water loss.

The lowest ratio is of COWASU and Baria Vuntao WSC at 15.0%, and these WSC are placed at the top 1 and 2 among all WSCs. Phu Yen WSC, Hoi An WSC, Khanh Hoa WSC show average performances between 20 - 30%, in contrast, SAWACO with 43.0% indicates a bad performance even among all WSCs in Vietnam.

4.7.8 Water Safety Plan (WSP)

Only COWASU completed an establishment of WSP, while other 5 WSCs are undertaking the process. Khanh Hoa WSC and Hoi An WSC just started the process for development, and are considering staffing for implementation.

4.7.9 No. of Analyzing Water Quality Parameters

COWASU analyzes the largest number of water quality parameters as 29, the followings are Baria Vuntao WSC with 20 parameters and SAWACO with 17 parameters. In case of Hoi An WSC, only 3 parameters such as turbidity, pH, residual chlorine checked daily are able to be examined by their own laboratory. They ask for analysis of other parameters to medical center in Quang Nam province monthly.

4.7.10 ISO17025

ISO17025 is an international standard to ensure implementation ability of analysis including management system, quality and technical capability of laboratory. Only COWASU acquired this certificate among 6 WSCs surveyed, other WSCs does not undertake the process for obtaining ISO17025.

4.7.11 Qualification/ Upgrading Training Participation Ratio (%/ total staff)

This indicates the participation ratio of staff in Qualification and Upgrading Training to all staffs.

The highest participation ratio is 63% by COWASU; the following ratios are 29% by Phu Yen WSC and 26% by Baria Vuntao WSC. The ratio of COWASU may be influenced by other factor of the technical assistance project, which provides financial support on training fee of College of Construction No.2 from the project budget. Meanwhile, Hoi An WSC lag behind other WSCs as 0%, and it could not be said that SAWACO with 6% and Khanh Hoa WSC with 7% are not willing to work for Qualification and Upgrading Training.

4.7.12 Off-the-Job-Training Participation Ratio (%/ staff)

This is a staff participation ratio in off-the-job-training to all staffs annually.

COWAS shows a best performance with 87%, and followed by Phu Yen WSC with 80% and Baria Vuntao WSC with 64%. In case of COWASU, the technical assistance project might be influenced. Other 3 WSCs remain between 10-20%. SAWACO, one of them, is planning to establish their training center at the next place of their water treatment plant, and to reduce off-the-job-training.

4.7.13 No. of Training Textbooks and manuals

This means the number of textbooks and manuals which are utilized for internal training. The manuals developed for practical operation and maintenance, not for editing with a training purpose, are counted.

COWASU has 7 self-developed textbooks and manuals, the largest number, including a manual for operation and maintenance, and a manual for pipeline design. In contrast, Khanh Hoa WSC, Hoi An WSC do not have any developed textbooks or manuals.

4.7.14 Annual Investment in Staff Training (VND/ staff)

The largest investment for human resource development is ensured by COWASU amounted for 4,376,731 VND, followed by Hoi An WSC with 1,000,000VND, Phu Yen WSC with 887,574VND and Baria Vuntao WSC with 769,231VND. The smallest investment on human resource development is 137,400 VND ensured by SAWACO, which is equivalent to 3% of COWASU's investment.

4.7.15 Customer Complaints / requests per 1000 connections

This is the number of customer complaints/ requests per 1000 connections. Generally it is regarded that the lower number means the higher customer's satisfaction. The lowest score is Khanh Hoa WSC with 3.3 cases/ 1000 connections, followed by Hoi An WSC with 4.3 cases/ 1000 connections. It is necessary, however, to consider other possibility that Khanh Hoa WSC and Hoi An WSC may not have adequate response system to customer's complaints/ requests. Therefore the results of comparison by this indicator should be recognized only as a reference.

Considering this point, the number of COWASU with 27.1 cases/ 1000 connections could be understood as a lower score.

4.7.16 Customer Needs/ Satisfaction Survey

Only COWASU, Baria Vuntao WSC and Phu Yen WSC conducted customer needs/ satisfaction survey in the past. In case of COWASU, these surveys were implemented in the recent 2 years, 2007 and 2008. SAWACO has not conducted these surveys, however contrived a different way to set up customer postbox in their office for collecting customer's voice.

4.7.17 No. of Public Relation Materials

COWASU has the largest number of public relation materials as 11 materials, followed by Phu Yen WSC as 6-12 materials (average 9 materials). Other WSC do not develop public relation materials particularly according to the survey results.

5. Succeeding Cooperation Plan for HRD in Urban Water Supply Sector

5.1 Past ODA project/ program on HRD by JICA

In the past, JICA has conducted projects/ programs on HRD in urban water supply as below.

Table 5-1 Past JICA's Project/Program on HRD

Project Name	Type	Period	Target institution	Input (Japanese Expert)	Input (Equipment)
Water Sector Training Center Project in the Southern Region	Mini-project type TA	2001-2003	College of Construction No.2	Long-term 4 experts, Short-term 19 experts	Equipment for distribution pipeline network such as Water leaks locator, Pipe cutter etc., Training yard, PC, Software for water works management
Improvement of Water Supply Works Management	Grassroots T.A.	2003-2005	COWASU	NA	Water leak locators, Residual chlorine analyzer, acoustic bar leak sound detection bar
Improvement of Water Supply Works Management	Grassroots T.A.	2004-2005	SAWACO	NA	Water leak locators, Residual chlorine analyzer, acoustic bar leak sound detection bar
Project on Human Resource Development for Water Sector in the Middle Region of Vietnam	T.A.	2007-2009	COWASU	17 experts	Equipment for water quality monitoring, for pipe installation, for water pressure measurement, Water leaks locator, PC, server, etc.

Source: JICA (2003, 2005) "Project Completion Report", and JICA (2009) "Final Evaluation Report" (Draft)

JICA extended the mini-project type technical assistance to College of Construction No.2 during 2001-2003 in order to enhance HRD in urban water supply sector. The project supported capacity development of the college's lecturers in the field of water distribution planning, waterworks management, non-revenue water reduction by the Japanese experts.

During 2003-2005, JICA implemented a grassroots technical assistance project to COWASU in cooperation with Yokohama Waterworks Bureau.

5.2 Training Needs and Constraints for HRD in Urban Water Sector

Training needs, in-service training institutions and constraints of HRD are described in this section. The self-evaluation, training needs and training institutions currently utilized are summarized as below based on the survey results.

Figure 5-2 Training Needs and Main Training Institutions

	Thua Thien Hue WSC (COWASU)	Saigon WSC (SAWACO)	Baria-Vuntao WSC (BWACO)	Khanh Hoa WSC (KAWASCO)	Phu Yen WSC	Hoi An WSC
1 Self-evaluation on staff capability	low level	NA	quite good	lower than others	average	NA
2 Training needs	Pipeline installation	Pipeline installation	Pipeline installation	Pipeline installation	O&M for inverter pump	O&M for facility & equipment
	Pipeline network management	Water loss prevention	Pipeline maintenance	O&M for WTP	O&M for WTP	Pipeline installation
	Water loss prevention	Water quality management	O&M for WTP	Water meter reading	Pipeline network management	Water loss prevention
	Asset management		O&M for pump station	Electricity	Water quality management	Water meter reading
	ISO14001		Pipeline network management	New technology (IT)	Water quality test	Finance
			General waterworks	Customer service	Calculation on hydraulic pressure	Marketing
			Business	Marketing	Project management	
3 Training institution to be utilized				Financial issues		
				English		
	College of Construction No.2	College of Construction No.2	College of Construction No.2	College of Construction No.2	College of Construction No.2	College of Construction No.2
	College of Urban Works Construction	College of Urban Works Construction	College of Urban Works Construction	College of Construction No.3	College of Construction No.3	College of Urban Works Construction
		Polytechnic University (HCMC)	PACE (Private)	University of Nha Trang	College of Industry (Phu Yen)	University of Construction
		University of Construction		University of Economy (HCMC)		

Source: Interview Survey

5.2.1 Training Needs for WSC Staffs

Training needs of 6 WSCs surveyed are diverse as the previous table. In particular highly demanded subjects common to the WSCs are pipeline installation, O&M of water treatment plant, O&M of water supply distribution network, reduction of non-revenue water. Generally the recognition of the training necessity on above issues is increasing, since VWSA authorized Qualification and Upgrading Training for skilled workers such as pump operator, water treatment plant operator, worker for pipeline installation, water meter reader/ bill collector every 2 years.

On the other hands, most of the WSCs feel the necessity of taking action on non-revenue water reduction because MOC has significantly focused on reduction of non-revenue water indicated as in the revised orientation. This point correlated to the fact of high training needs not only for non-revenue water prevention itself including a leakage detection, replacement and improvement of deteriorated pipelines, but also for O&M of distribution pipeline network including installation of new technologies such as DMA/DMZ and GIS, and for pipeline installation including improvement of pipeline installation technique/ connection technique.

In addition to the abovementioned strongly-rooted training needs, all WSCs are required to develop water safety plan (WSP) by Decision No.16/2008/QĐ-BXD/31 Dec 2008, thereby some WSCs which are going to develop WSP quickly such as SAWACO and Phu Yen WSC raised a training need on water quality management. Meanwhile, many WSCs tend to have a concern with business (Baria Vuntao WSC), marketing (Khanh Hoa WSC, Hoi An WSC), finance (Khanh Hoa WSC, Hoi An WSC) as privatization progresses recently.

5.2.2 Off-the-Job-Training Institutions

It could be said that College of Urban Works Construction and College of Construction No.2, as off-the-job-training institution, are the core training institutions for retraining of WSC's staff based on the survey results. Khanh Hoa WSC and Phu Yen WSC located in the southern-middle region utilized also College of Construction No.3. In some case, WSCs send their staff to College of Urban Works Construction in Hanoi for retraining from the middle region. In case of College of Construction No.2, they positively make an effort to dispatch their lecturers to WSCs in the middle region and try to contribute to WSCs in the reduction of training cost.

While according to the field survey only 3 off-the-job-training institutions, as the abovementioned, are identified for Qualification and Upgrading Training of WSC's staff.

Apart from the abovementioned colleges, WSCs also utilize local universities, polytechnic college and university of economy as outside training institutions for WSC's staff. However, these universities and colleges can provide rather theoretical training than practical training. In rare case, Baria Vuntao WSC sends their top and middle managers to private training institutions for studying business fields.

5.2.3 Constraints and Challenges for HRD in Urban Water Sector

Lack of National Qualification and Upgrading Training Scheme for Skilled Workers

Currently a systematic national training scheme targeting on working staffs in water supply sector is not established yet in the country. The VWSA proposed and developed a framework of Qualification and Upgrading Training scheme for skilled workers in 2005, and announced to all WSCs. The voluntary training system is just started along the right way. However, the curriculums, training contents, training durations are different among training institutions and not unified. Therefore, even though workers of same occupation are categorized into same grade, it might be happened that the level of knowledge and skills will be different. The VWSA or MOC are supposed to unify them under an authorized standard. Presently MOC is trying to develop a scheme for Qualification and Upgrading Training for skilled workers, so it is expected that MOC become a main actor to establish the national certificate system and the training system as a main actor as soon as possible.

Insufficient Retraining Function in the Middle Region

In the middle region, there is College of Construction No.3 which is expected to have a role of a retraining institution for WSCs in the region. However, it could be said that the training may not be well-functioning because the number of trainees are not large in fact in comparison to the South and the North. Thus, it is pointed out that the training environment for practical retraining with high quality is not sufficiently developed; thereby some WSCs in the middle region send their staffs to the training institutions at Hanoi or Ho Chi Minh City at more cost.

In order to improve this situation, it is desired to strengthen College of Construction No.3 or to establish new training institution as a retraining institution in the middle region. Currently MOC has a design plan to establish national training center in the region. However, they did not show a clear

policy to assign the role choosing from two alternatives; a Hue branch of College of Urban Works Construction or College of Construction No.3. MOC mentioned that they will inform their direction after discussions⁶. In either case, it is necessary to establish a national training center in the middle region which enables WSCs staffs to receive retraining at same level of the North or the South in order to bottom-up the holistic regional level in technical and management aspects.

Insufficient WSC's Budget on HRD

The poor WSCs with insufficient financial balance can not have enough budget amounts and not ensure an investment in HRD. These WSCs ask their staffs to burden a half of the training fee. Thereby the staffs of the poor WSCs tend to lose an opportunity to participate in the training. Looking at a Qualification and Upgrading Training for skilled worker, there is a large difference of the participation ratio among WSCs, it will take a time until all skilled workers are able to attend the retraining. Furthermore, WSCs which can afford of the trainings for staff every two years could be quite limited. There is a possibility that the gap between the poor WSCs and the rich WSCs could be getting larger and larger, thereby poor WSC may be left behind both at technical and management level.

Controlled Water Tariff and Profitability

For the WSCs which are not privatized, the maximum profit from water supply business is defined to limit to less than 3% of total turnover by the Joint Circular No.104/2004/TTLT-BTC/8 Nov 2004. People's Committee manages and determines the price at less than that range. The relatively large-scale WSCs make a profit from other business activities, but particularly small-scale WSCs are struggling with this business environment under this constraint. This structure influences on ensuring HRD budget eventually.

On the other hand, Ministry of Finance is considering revising standard for setting water tariffs; 3% profit at maximum in the existing standard would be changed into 5% profit at minimum according to the information from MOC. If this modification is placed into practice, this structural constraint is possibly expected to be eliminated.

⁶ In a report meeting with MOC dated 16 march 2009

5.3 Succeeding Cooperation plan for HRD in Urban Water Supply Sector

5.3.1 Cooperation Plan ①: Assistance to establishment of National Training Center in the middle region

MOC plans to establish national training centers as bases for HRD in water supply sector in each 3 region of the country; the North, the Middle and the South regions. This design is contained in the draft of new orientation for urban water supply sector which is presently waiting an approval from the prime minister. According to MOC's comments, since the content itself was mostly fixed already, the direction of this design could assume to be not changed. Additionally, MOC has recognized that College of Construction No.3 is not well-functioning as a retraining institution. Therefore they currently consider assigning College of Urban Works Construction in Hue city to be the national training center for water supply sector in the middle region if the facilities and equipment are more expanded.

The cooperation plan described here is to support the establishment of the national training center for water supply sector in the middle region, based on the above trend in the country. The plan will target to expand facilities and equipment of the existing Hue branch university of College of Urban Works Construction, and eventually similar scale of facilities and equipment to the university in Hanoi will be expected to be arranged.

The concrete support contents are shown as below.

- Establishment of small-scale water treatment plant for training⁷
- Other training materials and equipment (training yard for leak detection, training yard for pipeline installation, laboratory and analysis equipment, etc.)
- Curriculum development for retraining course
- Continuous support on capacity development of COWASU staffs

[Collaboration with COWASU]

To utilize human resources, facilities and equipment of COWASU could be merit for strengthening a practical training in the national training center. It could be presumably possible for COWASU, for instance, to provide their staffs as lecturers, facilities such as a training yard for pipeline installation,

⁷ College of Urban Works Construction has a small-scale water treatment plant with production capacity of about 1000m³/day, and provides it as a drinking water to neighboring residents.

laboratory, water treatment plant, and OJT in the COWASU office for studying customer service activities.

5.3.2 Cooperation Plan ②: Strengthening institutional capacity and building

In order to grade up technical and management level of WSCs for long-term nationally, institutional capacity of VWSA essentially needs to be strengthened. It is crucial to establish a system for sharing and disseminating the technologies and know-how of the advanced WSCs to the WSCs staying still at low level. If the system was not functioned well, there would have been a concern that the gap of technology and management among WSCs would have been still remaining at large. The advanced technology and management skill may exist in the limited number of WSCs with limited effectiveness. On the other words, it is expected to expand an individual achievement of each WSC as diffusing experiences from a point to a line and to an aspect, and to result in establishing a system to level up whole water supply sector. The expected roles for VWSA are large in providing and sharing top runner's know-how among WSCs, and in this sense the institutional development is very crucial.

According to the past activities of Science and Technology Board in the VWSA, some achievements such as developments of manuals and textbooks, of technical standard of Qualification and Upgrading Training for skilled workers, can be seen, even the activities of VWSA is not enough. In comparison to the Japanese Water Works Association, however, there are still some rooms to be improved for raising whole level of urban water supply sector. Currently the activity of VWSA branch is limited to regional meeting which is held formally once or twice a year and is not seemed to have exchange and study meetings in technical and management aspects among the member WSCs. Also only top management joined the regional meeting and there is no opportunity for skilled workers to participate and exchange information.

Based on these backgrounds, this cooperation plan proposes to strengthen institutional capacity. Main support contents to be assumed are shown as below.

- Support to open training seminars and workshops on the specific topics

- Support to strengthen the board activities in specific themes and support for WSCs and manufacturing companies to join the VWSA activities positively
 - Support for research activity in cooperation with WSC and manufacturing companies
 - Output (example): handbook for pipeline installation⁸, handbook for water supply equipment and materials
- Support to strengthen regional activities
 - Technical exchange seminars/ study meetings among the regional members (targeting on skilled workers particularly)

[Collaboration with COWASU]

COWASU's staffs will participate in training seminars and workshops, and research activities as lecturers, or one of members.

For instance, the handbook for pipeline installation made by COWASU summarizes the necessary and practical basic knowledge and skills in daily works. Such kind of information is expected to collect and develop by VWSA. COWASU and other advanced 2 or 3 WSCs should be invited and work together.

Other possible plans for strengthening the regional activities of VWSA could be technical exchange seminar for skilled workers, study meetings, and study tours. It is also effective ideas for inviting COWASU's staff as lecturers, or visiting pipeline installation sites/ a training yard for pipeline installation, exchanging their opinions and having a practical training.

5.3.3 Cooperation Plan ③: Expansion of COWASU experiences in HRD to other WSCs in the middle region

This cooperation plan is to disseminate the results and experiences of the technical assistance project closed in February 2009 to other WSCs in the middle region. The top runner catch-up approach adopted in the HRD project for water supply works in Cambodia also could be applicable to this plan. In other words, to enhance a dissemination of the COWASU's outputs enables to raise the level of other WSCs in the middle region.

⁸ COWASU opened a seminar for introducing output of the project in this February, at that time, provided a handbook for pipeline installation for skilled worker to the participants.

COWASU could be in the top runner position in the middle-scale cities in the field of technical and management spheres, thereby this plan supports for HRD targeting on some WSCs in the middle region. COWASU has communication relationships with some directors of other WSCs because COWASU used to be a responsible for the representative of VWSA in the middle region. Additionally some WSCs see COWASU as a model for their next future. Therefore support on HRD for other WSCs with cooperation to COWASU could be expected to have an effective output. The director of COWASU expressed a cooperation will raise technical and management levels in other WSCs of the middle region. Furthermore Khanh Hoa WSC, Phu Yen WSC and Hoi An WSC surveyed by this study team expect to receive a support in HRD field.

Based on these backgrounds, main support contents to be assumed are shown as below.

- Support on establishment of water safety plan
- Support on water quality management and water quality analysis
- Support on reduction of non-revenue water
- Support on strengthening customer service function
- Support on participation in Qualification and Upgrading Training for skilled workers
- Provision of equipment and materials (computer, equipment for water quality analysis, software for distribution pipeline network, software for GIS etc.)

Particularly water quality management could be the area highly demanded, because decision No.16 requires all WSCs to prepare water safety plan (WSP) and their actions have just started. The national training seminar for water safety plan (WSP) held by VWSA targets all WSCs. However, the duration is limited to only 3-4 days, and the progress is not clear⁹. Therefore the efficient achievement could be expected in this field if the next technical assistance follows up these situations with a continuous support from some Japanese experts and some COWASU's staffs.

Concretely, the next project will invite both the Japanese experts and COWASU's Staffs as outside lecturers and will extend a technical assistance, and equipment and materials. However it is necessary to conduct a detail needs survey for the target WSCs in advance. Also it is recommended to receive cooperation from Yokohama Waterworks Bureau which was engaged in the grassroots technical

⁹ According to WHO, MOC conducted a follow-up survey, however they could not receive satisfactory reply, thereby WHO has not received a formal answer from MOC.

assistance project and the previous project, and has a rich experience on practical waterworks as a local government.

With regard to Qualification and Upgrading Training, the project will invite lectures from College of Construction No.2, and enhance the target WSCs to take examinations for skilled workers.

[Collaboration with COWASU]

In order to conduct a practical training and technical assistance, it could be possible that the facilities and equipment such as a training yard for pipeline installation and laboratory in COWASU will be utilized effectively with an invitation of COWASU's staffs as lecturers.

Before designing the project, it is necessary to coordinate and discuss with director of COWASU especially on which fields and to which extend COWASU would be involved, as considering the training needs of the target WSCs.

5.3.4 Cooperation Plan ④: Establishment of Qualification and Upgrading Training for skilled worker

This cooperation plan is to support an establishment of a Qualification and Upgrading Training scheme for skilled worker in water supply sector, which is under consideration by MOC.

The Qualification and Upgrading Training scheme proposed by the VWSA is undertaken by WSCs, however, the curriculum, duration, examination contents are originally developed by each HRD institution such as College of Construction, and currently not unified. After the promulgation of "Law on Education and Vocational Training" formulated by Ministry of Education and Ministry of Labor, MOC is undertaking to establish the national training scheme, but the current progress is very slow because of a lack of enough experiences. The personnel department in MOC also requested a cooperation of dispatching a Japanese expert on curriculum development.

Based on this background, this plan will support to establish a curriculum of a Qualification and Upgrading Training scheme with dispatch of a Japanese expert to MOC.

In terms of the training scheme, HRD system would be effective when trained staffs would disseminate obtained knowledge and skills to their colleagues after training in order to level up holistic organizational capacity. Thereby it prompts to develop backup system and to make organization multilayered For instance, one of proposal training systems is; every trainee are obligated to make presentation on their results of the training after returning back to their workplace.

After the presentation, the training institution will issue the certificate after receiving a report from the director.

[Collaboration with COWASU]

The project will invite COWASU as a discussion member. COWASU, which sent many staffs to a Qualification and Upgrading Training for skilled workers, will be expected to provide some consideration points, advices and ideas on making the practical training contents from the view of WSC. It aims to establish an effective training scheme for skilled workers and water supply sector without losing substance.

5.3.5 Remarks

Cooperation plan ① could be essential for raising up capacity of WSCs especially at low level and urban water sector holistically. It is expected that the influence will be nationwide if VWSA could make their activities well-functioning.

Cooperation plan ② and ③ could be more realistic and more practical. Particularly in the middle region, COWASU is the most advanced WSC at technical and management levels, and the director expresses a positive attitude for cooperation to other WSCs in the region. Some directors of WSCs recognize the advanced level of COWASU. Therefore this plan is likely able to raise capacity of WSCs in the middle region.

The influence of cooperation plan ④ could be nationwide, it is necessary to unify the training scheme for water sector and to make it effective. MOC is expected to conduct quick actions on this issue by VWSA and WSCs.

Finally, these cooperation plans are assumed not only to be conducted individually, but possibly to be combined effectively and to be formed as one technical assistance project.

