

Fiscal Year 2011: Water Supply Project Formation Program

Ministry of Health, Labor and Welfare, Government of Japan

The Project on the human resource development for promoting sound water supply management of Da Nang City Water Supply Company, Vietnam Socialist Republic, from the aspect of Water Safety Plans

Japan International Corporation of Welfare Services (JICWELS)

## **1. Background of the study**

Da Nang City is one of the directly governed cities by the central government of Vietnam, which covers 1,257km<sup>2</sup> of governorate area, and has 940,000 of population (as of 2011). Da Nang City is situated almost in the center of Vietnam who extends to both north and south. As the 3<sup>rd</sup> largest city in Vietnam after Hanoi and Ho Chi Minh City, Da Nang City has urgent problem such as pressure for facilities construction to supply safe drinking-water in response to increasing water demand caused by recently activated economic activity (Tourism, Harbor business are the main runners) as well as appropriate operation and maintenance of the facilities.

Da Nang City is an important harbor base situated in the starting point in the eastern side of the East-West economic corridors (1,450km of total length) which cross to the east and west through Laos and Thailand to Myanmar of the Southeast Asia. Also Da Nang City possesses an important position of the distribution of Asian economic activities where Japan is involved.

In this respect, in future, expansion of the city and associated further increase of water demand are anticipated.

With the above situations surrounding water demand, in terms of safe drinking-water supply, Government of Vietnam proclaimed on 11th July 2007 that the Government makes much of securing safe drinking-water supply. And as the policy to achieve it, on 31<sup>st</sup> December 2008, it is decided that all water supply companies bear a duty to draft water safety plans. Safe drinking-water supply leads to enhance of support by customers regarding water supply services through protecting health of the citizens who receive services, so it is an important duties in promoting sound management of water supply utilities.

By the existing JICA project targeting Hue Water Supply Company (hereafter, HueWACO) in collaboration with YOKOHAMA Waterworks Bureau, in DAWACO, a roadmap for drafting Water Safety Plans has been made. In this regards, DAWACO has an advantage such as foundation for building a framework of collaboration and cooperation with Departments of Health and Education of the Danang City Peoples' Committee has already been established.

However, when performing safe drinking-water supply for responding to water demand which is considered urgent problem, it is necessary to effectively implement water safety plans based on human health and to make efforts to enhance sustainability. At the same time, it is indispensable for water supply utilities to further collaborate and cooperate with infrastructure, health, educational and

environmental sectors as well as to make efforts by themselves.

Main performance indicators on water supply management of DAWACO

N o	Indicators	year	2003	2009	2011	2025
1	Total population		558,000		942,000	1,400,000
2	Population served		359,000	524,000	700,000	1,330,000
3	Water demand volume	(m <sup>3</sup> /day)	47,000	96,068	155,000	357,000
4	Coverage	(%)	64	74	81	96
5	Number of connections (total)	(household)	54,000	no data		
6	Number of connection (Metered)	(household)	54,000	140,842	180,000	354,843
7	Number of public taps	(point)	no data	0		
8	Designed daily supply capacity	(m <sup>3</sup> /day)	80,000	155,000	155,000	375,000
9	Average daily supply	(m <sup>3</sup> /day)	94,520	132,000	149,854	420,000
10	Maximum daily supply	(m <sup>3</sup> /day)	no data	no data	165,000	450,000
11	Average daily revenue water	(m <sup>3</sup> /day)	47,000	96,068	116,886	357,000
12	Non-revenue water rate	(%)	44	32	22	15
13	Number of staff		380	512	551	800

## 2. Purpose of the study

In order to propose solutions to the above problems in Da Nang City, the study team conducted survey which contributes to formation of a project for advancing human resources development of DAWACO related to effective implementation of Water Safety Plans as one of the options for promotion of sound management of water supply business of DAWACO through making the most of the above advantages.

Furthermore, as a policy to secure sustainability for the future, the study has been conducted in considering building of a framework of collaboration and cooperation among DAWACO and the related sectors of Infrastructure, Health, Education and Environment by the initiative of Da Nang City Peoples' Committee.

## 3. Schedule and member of the study

### 3.1 Schedule of the study

6 to 23 February 2012 (18days)

### 3.2 Member of the study

**Name, Role, Organization**

Leader:

Shigeru Sugawara, General Control/Water Safety Planning: HRD aspect, JICWELS

Sub-leader:

Hiroshi Fujita, Total Planning, Ministry of Health, Labour and Welfare, Japan

Member:

Yasutoshi Nagai, Water Safety Planning: Facilities aspect, Yokohama Water Co.

Shunsuke Takahashi, Planning & Construction of Water Facilities, Yokohama Waterworks Bureau

Takahiko Nakai, Water Safety Planning: Water Quality Analysis aspect, Yokohama Waterworks Bureau

#### **4. Contents of the exchange of opinions with DAWACO regarding proposed plan to solve problems**

Study team exchanged opinions with DAWACO based on the findings such as identified problems through site visits and obtained information through hearing with relevant staff of the Organization.

Resultingly, expecting a next phase of JICA capacity building project may be carried out sequentially after the completion of the existing related project by JICA, a proposed plan requesting dispatches of experts in short and long term through public and private collaboration utilizing “Public Private Partnership (PPP)” scheme in a part are as follows;

The proposed plan should be carried out in conjunction with the expected next phase of JICA project.

##### **4.1. Counter part authority**

The counter part authority of the proposed plan is DAWACO (Da Nang water supply company)

##### **4.2 Purpose of the plan**

###### **(1) Short term purpose**

As a direct effect and benefit to the inhabitants in the target area, by this proposed plan the inhabitants in the served area of DAWACO can obtain safe drinking-water which contributes to the human health.

###### **(2) Mid – long term purpose**

By this proposed plan, all the inhabitants in the served area of DAWACO can obtain safe drinking-water which contributes to the human health. Through this achievement, DAWACO will announce a declaration of safety of drinking-water to all served area.

##### **4.3 Area of cooperation**

Human resources development in DAWACO for promoting sound management of water supply business which contributes to human health, from the aspect of Water Safety Plans

##### **4.4 Form of cooperation**

Form of cooperation by the proposed plan is to carry out human resources development for staff of DAWACO in collaboration with Department of Construction (DOC), Department of Health (DOH) and Department of Education (DOE), and other related authorities such as Department of Natural Resource and Environment (DONRE), Da Nang Power One Member Limited Company (Electricity Power Company), etc. in Da Nang City as needed.

##### **4.5 Time of implementation**

The proposed plan is assumed to be started from the last half of fiscal year 2012 to the first half of fiscal year 2013. However, it is assumed that the proposed plans is carried out while going along the trend of the existing JICA project and in conjunction with the expected next phase of JICA project

Period of the proposed plan is about 3 years.

#### 4.6 Activities of the plan

Activities as indicated below are carried out in collaboration with the expected next phase of JICA project.

(1) By the initiative of People's committee of Da Nang city, set out Water Safety Unit in order to realize the Declaration of Safety of drinking-water. Through this unit, push forward the making of a framework of collaboration with DOC, DOH, DOE and DONRE. (Refer to [Annex 1](#): Image of Water Safety Unit)

As for the concrete activity, the following is thought about.

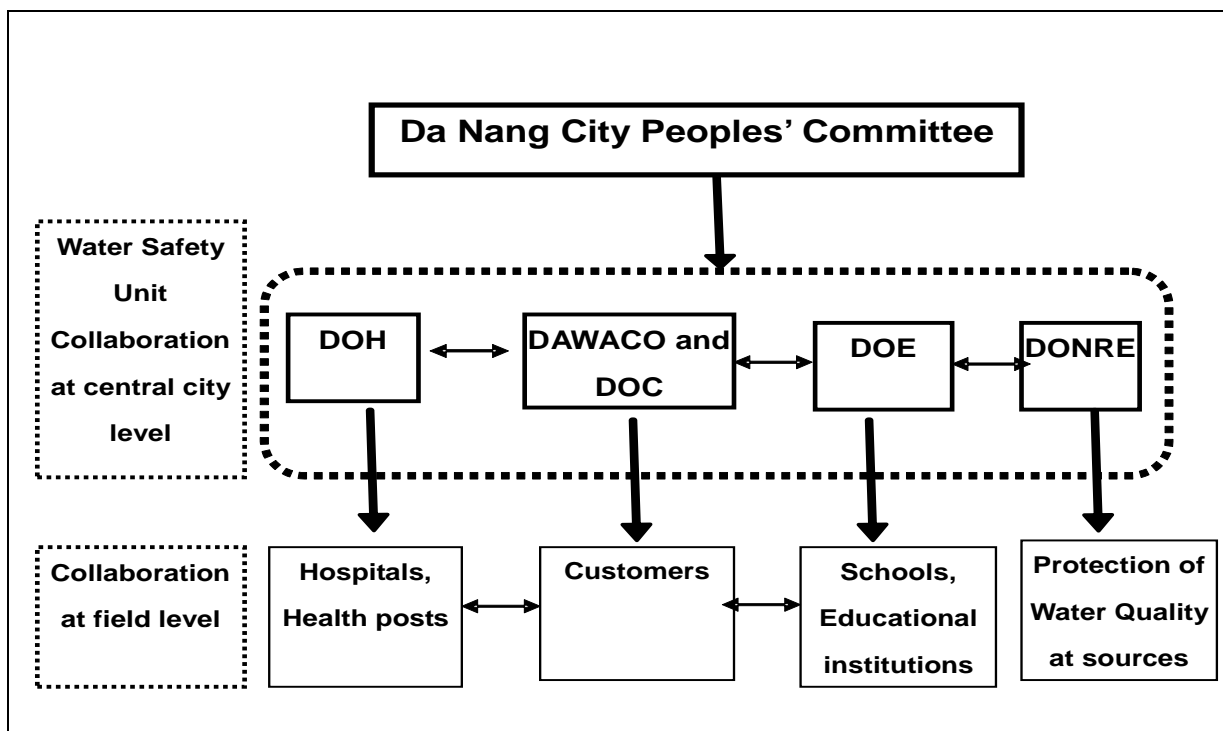
- Carry out water quality monitoring targeting water receiving tanks in cooperation with Preventive Medicine Center (PMC) of Department of Health, Da Nang City through the above Water Safety Unit
  - Select main primary schools and junior high schools in the served area as water quality monitoring points, and carry out continuous monitoring for turbidity, residual chlorine, pH (Each parameter can be analyzed manually) as minimum requirements of basic parameters for monitoring
  - Dissemination and awareness regarding merits on a health aspect and the cost aspect brought by safe drinking-water
- (2) Toward the Declaration of Safety of drinking-water, carry out technical exchanges between HueWACO to utilize its achievements and experiences.
- (3) Draft action plan toward the Declaration of Safety of drinking-water (refer to [Annex 2](#): Case of Declaration of Safety of drinking-water by HueWACO)
- (4) Actively utilize the Training Center for Water Sector in the Central Region in the College of Urban Works Construction in Hue, which is established by the 2<sup>nd</sup> phase of JICA Project
- (5) As the first step for sound management, in terms of budget for the cost of operation and maintenance of the facilities, try to cover it with original resources of DAWACO based on main financial funds brought by collection rate
- (6) Based on the above budget, carry out the following measures against leakage;
- Carry out planning of leakage detection in conjunction with laying and maintenance of distribution pipes
  - Carry out setting of flow meters in the blocks (District Meter Area (DMA)) in the served area and monitoring the DMA
  - Carry out further promotion of enlarging blocks (DMAs) in the served area

- (7) Carry out appropriate water treatment based on designed capacity of the water treatment plant and also result (data) of water quality analysis in the plants
- (8) Establish resistant distribution block system based on setting of the distribution reservoir in the water supply system (which contribute to energy-saving measures as well)
- (9) In terms of examination for construction of new water treatment plant and new setting of distribution network, carry out examination taking into account of the discussion with Experts of public and private sectors in the Japanese side, including PPP option (refer to Annex 3: Expected expansion of water treatment capacity)
- (10) Push forward the introduction of the IT-related system to appropriately operate water distribution control in the served area
  - SCADA system (supervisory control and data acquisition system): Control of volume and pressure of distribution water, etc. (such as monitoring of water quality: residual chlorine, etc.)
  - GIS: Mapping system of distribution network
- (11) Carry out exchange of information and cooperation with World Health Organization (WHO) in terms of drafting and implementation of Water Safety Plans

## **5. Conclusion**

By the above proposed plan being carried out, in conjunction with the JICA project that is carried out now and the expected next phase of the JICA project in future, it is expected that in the central region of Vietnam assumed to be a target by JICA project, DAWACO will occupy the leading position with HueWACO in terms of capacity building of water supply management of the region.

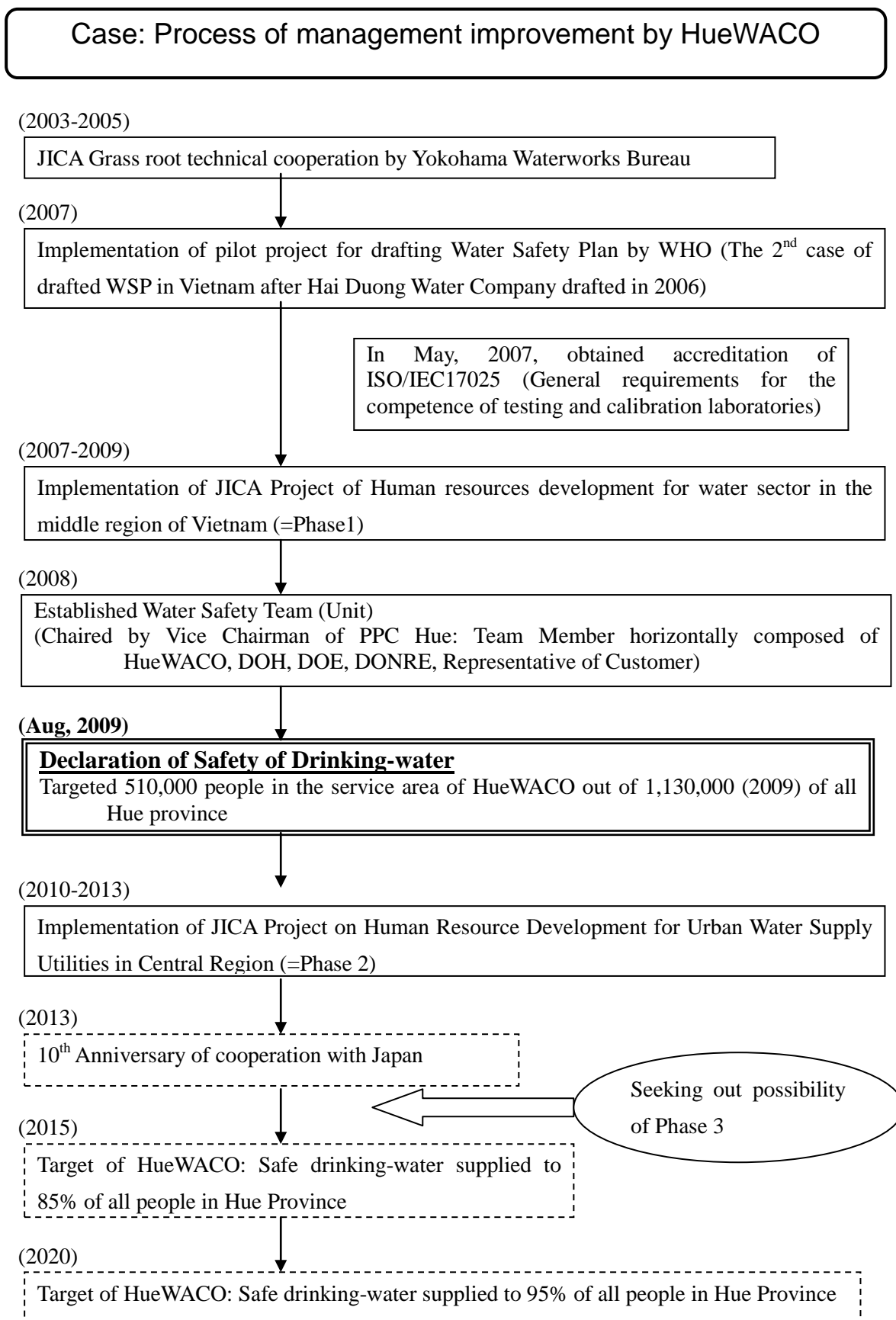
## Annex 1: Image of Water Safety Unit



Field of charge and On-site organization of each organization  
constituting a framework of the collaboration from the above Unit

Organization involved in the collaboration	Field of charge	On-site organization
DAWACO	Operation and maintenance of facilities related to water supply management, chlorination for disinfection and water quality analysis	
Department of Construction (DOC)	Observation and guidance for urban infrastructure construction including water supply and sewerage system	
Department of Health (DOH)	Improvement of daily life and the health through health guidance, Hygiene management instruction, Inspection of quality of supplied water	Hospitals, Health posts
Department of Education (DOE)	Social development in the City through education	Schools, Educational institutions
Department of Natural Resources and Environment (DONRE)	Protection and pollution control of water quality at water sources such as lakes, reservoirs and rivers	

## Annex 2: Case of Declaration of Safety of drinking-water by HueWACO



### Annex 3: Expected expansion of water treatment capacity

Actual total designed supply capacity is 155,000m<sup>3</sup>/d by the existing 3 water treatment plants.

Construction of new water treatment plant with designed capacity of 120,000m<sup>3</sup>/d (construction is going to be started in 2014 and going to be completed in 2018) and new setting of distribution network is under examination

List of water treatment plants: Expected expansion of water treatment capacity (including construction of new water treatment plants (WTP))

No.	Name of WTP	Water Source	Year of construction	Capacity (m <sup>3</sup> /d)	Process	Capacity of reservers (m <sup>3</sup> )
1	Cau Do	Surface	1965	120,000	Rapid sand filter	22,000m <sup>3</sup> /3 reservers
2	San Bay	Surface	1974	30,000	Rapid sand filter	4,000m <sup>3</sup> /2 reservers
3	Son Tra	Surface	1985	5,000	Rapid sand filter	none
4	(Expansion) Cau Do	Surface	2012	50,000	Rapid sand filter	none
5	(New) Cu De	Surface	2018	120,000	Rapid sand filter	22,000 m <sup>3</sup> /2 reservers
6	(Expansion) Cau Do or Cu De	Surface	2022	50,000	Rapid sand filter	10,000 m <sup>3</sup> /1 reserver
Total designed supply capacity (m <sup>3</sup> /d)				375,000		