THE REPORT ON THE IMPLEMENTATION OF THE WATER SAFETY PLAN

In pilot models and in water utilities participating in WSP – Phase 1

December-2010
1. INTRODUCTION

Unsafe water use can cause harms to public health. Thus, safe water use is a basic need of life. Since 2007, WHO has supported Vietnam in developing the Water Safety Plan (WSP), aiming at improving domestic water supply. Within the program, in December, 2008, The Ministry of Construction issued “Water Safety Regulations” (No.16/ QD-BXD) which is a legal document for the water supply sector in Vietnam to develop WSP. So far, 45 out of 68 water utilities in Vietnam have benefited from training courses on WSP- phase 1, in which Hai Duong, Hue, Vinh Long water utilities are carrying pilot models on WSP very effectively.

In the second phase, starting at mid 2010, with the continuing support from WHO, 23 more water utilities would be trained and 3 more pilot models would be set up in Hai Phong, Khanh Hoa and Vung Tau. Besides, the pilot model in Quang Tri, a part of Mek-Watsan project, as approved by both WHO and UN-HABITAT for further development in the second phase.

The Vietnam Water Supply and Sewerage Association (VWSA) is a key organization to be assigned a task of giving technical advices for water utilities in implementing WSP in Vietnam. One of the activities at the outset of the second phase is to survey and assess the implementation of water utilities as well as pilot models in the first phase, and evaluate to understand the potentiality for the WSP implementation of the pilot models in the second phase.

In term of methodology, the following report has been made after VWSA/ MoC/ MoH and consultants conducted a survey through site visits to pilots models in Hai Duong, Hue, Vinh Long water utilities (during the period from August 2010 to December 2010). In addition, VWSA also distributed questionnaire to 45 water utilities, who took part in the first phase of WSP. In the mid of November 2010, VWSP received the answers from 20 utilities.

This report consists of three sections: i) Survey results on the pilot models in Vinh Long, Hue and Hai Duong water supply utilities; ii) Feedback for the questionnaire from water utilities who participated in the first phase of the WSP and iii) Annex presenting questionnaire forms collected from water supply companies participated in Phase 1 of WSP.

2. SURVEY RESULTS ON THE PILOT MODELS IN VINH LONG, HUE AND HAIDUONG WATER SUPPLY COMPANIES

2.1 Methodology and scope of works

The on-site surveys were conducted by expert team of WHO/VWSA/ MOC/MoH. Time spent for each water company pilot is 1-2 days, through experience exchanges, interviews, comments and information gathered from the WSP documents available and from the site visits. The scope of work under missions includes:

The report on the implementation of the Water Safety Plan, Phase 1- VWSA, Page 2
-Conduct meetings with the Company management board and the WSP team; inform the mission about purposes and requirements of the assessment survey.

-Presentation of implementation of WSP process; identify the gaps, obstacles and successfully factors of WSP.

-Review of relevant WSP records and documents; comment on the company’s WSP manual to meet the requirements of the WHO guidelines as newest version issued in 2010.

-Learn about the willingness and aspirations of the company to continue to participate in the WSP programme.

-Conduct site visits on raw water sources, water treatment plants, distribution network, consumer premises, etc. During field visit, the mission team conducted a quick interview as a spot check of some households to learn about their opinions on the clean water services.

-Inform about next steps of WSP for Phase 2 in Vietnam. As the pilots from Phase 1, these water supply companies are requested to attend training workshops in Phase 2 and ready to share their experience to new participated companies in WSP.

2.2 Report on the WSP implementation in Vinh Long Water Supply State One Member Company Limited (VIWACO)

2.2.1 Overview of the water service of Viwaco

VIWACO is managing 09 water supply systems, serving for urban areas in Vinh Long with the total design capacity of 41,200 m3/day. The total operation capacity is 33,000 m3/day, accounting for 79% of the design capacity. The company is serving for 39,900 urban households with an average coverage of 81%.

The average residential use of clean water in urban areas is 143 litter/person/day. The average water supply duration per day reaches approximately 24h/day. The main water supply systems managed and operated by Viwaco cover Vinh Long city, Long Ho, Phung Quoi, Thanh Binh, Binh Minh, Vung Liem, Tra On and Cai Ngang town.
2.2.2. The process to approach the WSP of WHO

Viwaco was selected by WHO and VWSA to be a pilot model for implementing WSP in Viet Nam in 2007. The company also participated in a training course on WSP organized by WHO in Da Lat (12/2007). Some staff of the company joined a conference in Singapore (Feb 2008) with other Asian water utilities.
The company has officially launched the WSP since March 2008 and the WSP implementation began in October 2008.

2.2.3. The implementation of WSP in Viwaco

Assemble the WSP Team

Since 2008, the WSP team has been assembled, including the following members:
- From the company:  
  +The Deputy Director – Team leader
  - The Heads of the Technical, Department, Sale Department, Lab Department, Water Loss Prevention Department
- From local authorities: Environmental Police Department, Vinh Long Police Department, and Preventive Health Center of Vinh Long.

WSP Implementation:

- Compiling a WSP manual for water supply system, including main points such as describing water supply system; identifying hazards, setting up a risk management strategy; setting up a management procedure; making records of the operation and maintenance process; and setting up implementation programme and carrying out internal training courses.
- Monitoring operation and maintenance: The quantity and quality of clean water: Pressure, coverage and supply duration, non-revenue water, material and energy consumption

- Investment: Installing stand-by generators; automatic control (pump inverters)

- Implementation of back-up programs: training workers and instructing them to implement WSP; doing regular maintenance; applying advanced technologies such as: using SCADA-Supervisory Control and Data Acquisition system.

- Implementation of verifying tasks: making records of operation and maintenance, customer claims, regularly taking samples and test (4times/month); every quarters, the WSP team checks, evaluates, assess and report the WSP implementation

2.2.4. Comments /Conclusion.

- The Management Board of the company has emphasized that the results of the WSP implementation in Vinh Long are very positive, helping the company actively control, anticipate and mitigate hazards and risks occurred during water production and distribution, ensuring the achievement of WSP targets.

- The WSP has raised awareness and O&M skills of workers at water supply systems.

- Despite of being provided the QA tool (the short version and translated from English) not too long, the company has carried out detailed assessments on the implementation of WSP by this tool and initially gained certain effectiveness

- The company has built up a good relation with customers in water supply and with stakeholders in water distribution as well as water resource protection.

2.2.5. Recommendations of the WSP team of Vinh Long Water Supply Company

The company would like to propose WHO and VWSA to continue providing technical and financial support to implement WSP. Besides, the company will actively propose provincial people’s committee (PPC) to set up a provincial steering committee on WSP. At the same time, the company also will recommend the VWSA and member companies to consider a proposal for a reform of water tariffs in order to contribute to a sustainable and effective WSP implementation.
2.3 Report on the WSP implementation in Thua Thien Hue Construction and Water Supply State One Member Company Limited (Huewaco)

2.3.1. Overview of the water service of Huewaco.

Huewaco was formed quite a long time, in 1909. This company is responsible for serving drinking water for the whole province. At present, Huewaco is managing 16 water treatment plants and a water distribution network with the total capacity of 160,000 m³/day.

2.3.2 The process to approach the WSP of WHO

In 2001, Huewaco launched the water safety plan which was the precursor of the WSP of WHO. In 2004, the company obtained the ISO 9001:2000 certificate on water production and distribution. In 2007, the company achieved the ISO 17025 certificate on water quality analysis. Also in 2007, Huewaco approached the WSP through a training course organized by WHO and VWSA. After that, the company revised its existing documents to make them more suitable with the guidance of WHO.

2.3.3. The implementation of WSP in Huewaco

Assemble the WSP Team:

WSP Team of Huewaco was assembled, including:
+ The Director of the Company: team leader;
+ The heads of Department: Water Quality Department; Technical Department, Design Department Construction Department; Administrative Department and Pipe System Management Department
+ Forman, team leaders in water plants.
+ Chief of the branches

Implementation:

- From 2007-2009, Huewaco implemented the WSP, following the guidance of WHO. The company compiled the WSP manual for the implementation;
- Paying attention to identifying risks and fails and prioritising risk management;
- Carrying out back-up programs to WSP;
- Receiving support and favorable conditions from local authorities. The Memorandum of Understanding on co-operation to reserve water recourse was signed among local sectors and authorities.
- Organizing a improvement program on management skills and water treatment operations
- The water plants were upgraded, renovated and newly constructed with modern technology (such as installation of SCADA, Gavel electrolysis machine; stand-by generators; using appropriate chemicals in water treatment process like PAC, Soda, activated charcoal, polymer, etc.)
- Constructing and equipping modern labs
- Mapping water quality of the network and monitoring water resource; installin continuous water quality measures in all water plants; installing floating oil barries at water collection points and aquarium to monitor water resource pollution; constructing transformer yards, supplementing Chlorine. The water can be drunk directly from tap.
- Solving customers’ complaints about water quality
- Implementing a human resource improvement program; organizing workshops on WSP at the company;
- Co-operating with donors to organize OJT and OFFJT training courses on water analysis and water treatment skills and on the guidance of working manual.
- Organizing public activities such as: organizing contests to understand more about dirking water or organizing activities for children with environment and water resource management, etc.
- International co-operation: In 2008, Huewaco had a presentation at Philwater in Philippine; in 2009 in Singapore and in an international forum on sustainable urban water supply improvement in Southeast Asia in Japan in 210
2.3.4. Comments /Conclusions

-The Management Board has emphasized that the implementation of WSP in Thua Thien Hue has gained very high positive results and helped the company active in prevention and minimize of risks and hazards during the process of water production and distribution in order to achieve the target of water safety. In Thua Thien Hue, people can drink water at tap across the water distribution network.

-WSP has raised awareness and operation and management skills of workers at water supply systems;

-Although the company was just provided with QA tool (the short version and translated from English), the company has carried out detailed assessments on the implementation of WSP by this tool and initially gained certain effectiveness.

-The company has created a good relation with customers in water supply and with stakeholders in water distribution as well as water resource protection.

2.4 Report on the WSP implementation in Hai Duong Water Supply State One Member Company Limited (HADUWASUCO)

2.4.1. Overview of the water service of the company

(HADUWASUCO) provides water for Hai Duong province. The company, at present, is managing 10 distribution systems including water plants and a distribution network with a capacity of 68,900m³/day, in which the water supply system in Hai Duong city, with a capacity of 40,000m³/day, is the largest. The others having medium and small capacities are Cam Giang, Binh Gian, Phu Thai, Kinh Mon, Tu Ky, Chi Linh and Dong Lac. In 2011, four more water supply systems namely Gia Loc, Thanh Ha, THanh Mien, Minh Tan will be put into operation.

HADUWASUCO has already obtained the ISO 9001-2009 certificate.

2.4.2. The process to approach the WSP of WHO

Hai Duong has been on the list of pilot model of the first phase since 2008. The company attended WSP training course organized in Lao Cai by WHO in association with VWSA. Resource staffs of the company had been participating in WSP programme and sharing their experience in later training course with other water supply utilities.
2.4.3. The implementation of WSP in Haduwaco

Establishment of WSP Team.

The WSP Team of the company was assembled in September 2010. The member of WSP team includes:

- Technical Deputy Director (Team leader)
- Business Deputy Director (Deputy Leader)
- Head of Business Division (Secretary)
- Other members are heads and directors of belong-water utilities

Mover over, the company has issued a working regulation defining roles and duties of the WSP team and it’s members. The members of WSP team excludes experts from provincial authorities related to water supply such as the Department of Construction, the Department of Natural Resources and Environment, Preventive Health Center,… However, the WSP regulation also defines a close coordination with the above agencies in order to accomplish its missions.

WSP Implementation

- Issuing a WSP manual in the early 2010 which at first was applied to the biggest water supply system managed by the company, Hai Duong city. Despite the fact that, during the past time, the smaller systems in downtowns had deployed some preventive contents to improve the quality of drinking water, the company, in theoretically, has not issued separate WSP manuals for each water system.
- Being able to define hazards and fails which may occur in water plants and preventive and recovery measures.
a) To the watershed (from river)
There might be pollution caused by pesticides, waterway means of transport, dredging, mining mud and sand, salt intrusion, discharging sewage from households living in the basin. Prevention and mitigation measures have been already determined and would be put in action if necessary

b) Underground water sources:
There might be pollution occurred around wells due to agriculture and the permeability of domestic wastewater. Prevention and mitigation measures have been already determined and would be put in action if necessary

c) Pumping stations:
There might be pollution caused by algae, turbidity changes, and unreliability of electricity, mud and sand sedimentation. Prevention and mitigation measures have been already determined and would be put in action if necessary

d) Water treatment plants:
There might be hazards caused by treatment lines such as flocculation, toxic substance separation, organic removal, disinfectant, inaccurate chemical quantitative analysis. Prevention and mitigation measures have been already determined and would be put in action if necessary

e) Water distribution network and customer premises:
There might be pollution because of unexpected water supply interruption (power off), water contamination by construction or intentional actions of users. The other important point is to maintain the chlorine residual at the end of distribution network to avoid the risk of re-infection. Prevention and mitigation measures have been already determined and would be put in action if necessary

- During the 2010 period, the company undertook many control measures, for example reinforcing water resource exploitation works and measures to improve the quantifying chemicals which help promoting the quality of treated water. The company made the water quality map especially locating water supply areas which were at a risk of low water quality; regularly checking the quality of the pipe system; cleaning and replacing poor quality pipes. As the failures occurred, they would be isolated and fixed.

- Equipment: Recently, the company has installed continuous PH measures, turbidity, and chlorine residual of intake water and produced water.
- Public relation: Paying attention to public relation, providing documents, information on the water quality for customer on a regular basis and encourage them to involve in movements to sanitation and water resource protection

- Currently, the company continues compiling WSP manual for water supply systems in town as well as water treatment process and water quality manual for operation units.

2.4.4. Comments /Conclusions

- The Management Board of the company has emphasized that WSP implementation in Hai Duong has brought about initial effectiveness, helping the company to control, anticipate and mitigate actively hazards and risks occurred during water production and distribution, ensuring the achievement of WSP targets.

- The WSP has raised the awareness and O&M skills of workers at water supply systems

- The company has not evaluated the WSP implementation in detail by using quality assurance toolkit. However, whenever it is translated, they will do the trial.
3. REPORT ON WATER SAFETY PLAN IMPLEMENTATION IN WATER UTILITIES PARTICIPATING IN THE FIRST PHASE TRAINING COURSES

3.1 OVERVIEW

The first phase of the Water Safety Plan (WSP) in Vietnam officially started in 2006. From 2007, the World Health Organization (WHO) initially cooperated with Vietnam Water Supply and Sewerage Association (VWSA) to carry out a number of training courses for urban water utilities in Vietnam. During two years of 2007 and 2008, six training courses for 45 out of 68 urban water utilities in 64 cities and provinces were organized. These companies were considered to officially participate in the first phase WSP program.

Table 1: Training courses in 2007-2008

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Location</th>
<th>Quantity of water utilities</th>
<th>Quantity of participants</th>
<th>Trainer</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>3 – 5 / 5 /2007</td>
<td>Hanoi</td>
<td>08</td>
<td>33</td>
<td>Oversea</td>
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<tr>
<td>02</td>
<td>7-10 / 5 /2007</td>
<td>Ho Chi Minh city</td>
<td>07</td>
<td>36</td>
<td>Oversea</td>
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<tr>
<td>03</td>
<td>19 – 22 /11 /2007</td>
<td>Da Lat city</td>
<td>08</td>
<td>33</td>
<td>Oversea</td>
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<tr>
<td>04</td>
<td>16 – 18 / 7 /2008</td>
<td>Lao Cai city</td>
<td>08</td>
<td>33</td>
<td>Local</td>
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<tr>
<td>05</td>
<td>09 – 12 / 9 /2008</td>
<td>Hue city</td>
<td>08</td>
<td>34</td>
<td>Local</td>
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<tr>
<td>06</td>
<td>04 – 07 / 11 /2008</td>
<td>Can Tho city</td>
<td>08</td>
<td>44</td>
<td>Local</td>
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</tbody>
</table>

In 2009, VWSA dispatched the questionnaires to participating urban water utilities to make a survey on WSP implementation after the training courses. Besides, the VWSA also co-operated with WHO to assess WSP implementation of some companies and assigned the consultants to provide technical support to pilot-models. (data of the survey in 2009 has been already sent to WHO in Vietnam)

In preparation for the second phase, in the end of 2010 the VWSA prepared and sent the questionnaire to 45 urban water utilities to collect the information. Excluding the 3 pilot-models that the consultant made the survey and had the report in the part 1 of this report, there were the feedbacks from 17/45 utilities. The following is the list of those companies sending back the answers for the questionnaires.

*Northern Region*: Bắc Giang, Bắc Ninh, Hà Đông, Hà Nội, Hải Phòng, Hòa Bình, Nghệ An, Ninh Bình, Quảng Ninh, Thái Bình (10 companies)

*Central Region*: Đà Nẵng, Bình Định, Khánh Hòa (03 companies)

*Southern Region*: Bến Tre, Hậu Giang, Sài Gòn, Trà Vinh (04 companies)
In the first phase, three companies, including Hai Duong, Thua Thien Hue and Vinh Long Water Utilities, were selected to develop pilot-models. These three pilot-models have achieved a lot of positive results in the WSP implementation and were assessed through the survey as presented in the first part of this report.

On the other hand, 25 out of 45 water utilities participating in the training courses did not reply. Through our investigation and direct discussion, we realized that although these utilities paid attention to WSP, the application after the training courses was limited. Additionally, some staffs after participating the training courses moved to work for other companies. Some water utilities already applied the ISO to manage the water quality, the results of the WSP application therefore, were not sufficient. On the other hand, the budget for the first phase was not much. WHO and his partners in Vietnam just organized the training courses and provided direct technical support to three pilot-models, but not provide other technical support (such as on-site and online support, WSP dissemination…) for other water utilities as in the second phase. Therefore, the results of the first phase of WSP implementation are likely not to meet the expectation.

The following report is made to summarise the WSP implementation of the above 17 urban water utilities, through which precious lessons and experiences would be drawn for the second phase. The data provided by the water utilities were up to quarter 3, 2010

3.2 INTRODUCTION TO THE SURVEY CONTENTS AND METHODOLOGY

The questionnaire sent to water utilities includes a 37 questions arranged in tables and charts. Each main question has several sub-questions. The questionnaire was divided in the following key parts:

A- Introduction and guidance to answers
B- General information about the company and water supply system
C- The process of WSP implementation
D- Specific information on WSP of each water supply system

The questionnaire was prepared on MS EXCEL, including questions that allow ticking off the available options in order to save time, focus on the main points and be convenient for summarising the results.

The questionnaire was sent to the water utilities via 2 ways: email with one electronic file attachment and express with one CD dish. The feedback was requested to sent via email. While answering the questionnaires, some companies contacted to VWSA and received support from WSP specialists of the VWSA.

3.3 SURVEY RESULTS SUMMARY
**Table 2: General information about the company and management responsibility of water supply system**

<table>
<thead>
<tr>
<th>Items</th>
<th>Bắc Giang</th>
<th>Bắc Ninh</th>
<th>Bến Tre</th>
<th>Bình Định</th>
<th>Đà Nẵng</th>
<th>Hà Nội</th>
<th>Hải Phòng</th>
<th>Hậu Giang</th>
<th>Hòa Bình</th>
<th>Khánh Hòa</th>
<th>Nghệ An</th>
<th>Ninh Bình</th>
<th>Quốc Ninh</th>
<th>Thái Bình</th>
<th>Trà Vinh</th>
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<tbody>
<tr>
<td>Population served with water (person)</td>
<td>120,000</td>
<td>130,000</td>
<td>160,000</td>
<td>270,000</td>
<td>610,000</td>
<td>200,000</td>
<td>1,150,000</td>
<td>2,150,000</td>
<td>1,900</td>
<td>405,000</td>
<td>290,000</td>
<td>190,000</td>
<td>130,000</td>
<td>6,000,000</td>
<td>155,000</td>
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<td>Quality of company staffs</td>
<td>165</td>
<td>212</td>
<td>196</td>
<td>265</td>
<td>412</td>
<td>394</td>
<td>2,245</td>
<td>1024</td>
<td>192</td>
<td>353</td>
<td>442</td>
<td>200</td>
<td>938</td>
<td>265</td>
<td>227</td>
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<td>Water users</td>
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<td>All the water utilities have the same types of water users such as water for residential use, industrial use, admin, commercial and service use</td>
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<td>Quantity of water supply systems managed by the company</td>
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<td>Almost water utilities have to manage a number of water supply systems within the province (city/town/small town)</td>
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<td>Management Responsibility of water supply systems</td>
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<tr>
<td>Almost water utilities are transferred to one state member company limited to implement corporate law. The companies must be responsible for quality of water treated and distributed to the users. The water resources for water plants (underground water or surface water) managed by Water Resource Department under Ministry of Environment and Natural Resources.</td>
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**Table 3 – Overview of the WSP implementation**

<table>
<thead>
<tr>
<th>Items</th>
<th>Bắc Giang</th>
<th>Bắc Ninh</th>
<th>Bến Tre</th>
<th>Bình Định</th>
<th>Đà Nẵng</th>
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<th>Hải Phòng</th>
<th>Hậu Giang</th>
<th>Hòa Bình</th>
<th>Khánh Hòa</th>
<th>Nghệ An</th>
<th>Ninh Bình</th>
<th>Quốc Ninh</th>
<th>Thái Bình</th>
<th>Trà Vinh</th>
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<tr>
<td>Confirm the necessity of WSP</td>
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<tr>
<td>All water companies confirmed the necessity of WSP. In addition, they all agreed that the regulation of water safety (Decision No 16/BXD/2007) is an initial important legal base for urban water companies in Vietnam to implement WSP.</td>
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<td>Apply strictly Decision No 16/BXD</td>
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<td>All water companies said that it is not able to strictly follow the Decision No.16/BXD because of inconsistent in terms of unclear financial mechanism, the ability of the collaboration among relevant ministries.</td>
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<tr>
<td>Support from local authority</td>
<td>●</td>
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<tr>
<td>Already establish WSP Team</td>
<td>●</td>
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<td>Be able to acquire the content of training course</td>
<td>●</td>
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<td>Already identify risks</td>
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<td>Already carried out communication and awareness campaigns</td>
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Table 4 – Priority Issues for WSP implementation

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<th>Bến Tre</th>
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<th>Đà Nẵng</th>
<th>Hải Dương</th>
<th>Hải Nam</th>
<th>Hải Phòng</th>
<th>Hòa Bình</th>
<th>Hòa Hiệp</th>
<th>Nghệ An</th>
<th>Ninh Bình</th>
<th>Quảng Bình</th>
<th>Quảng Ngãi</th>
<th>Sai Gòn</th>
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<td>Improve water supply resource</td>
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<td>Treated water Quality control system</td>
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3.4 CONCLUSION AND RECOMMENDATION

The necessity and awareness of Water Safety Plan

The percentage of companies responding to the questionnaires about the WSP implementation reflects the low awareness and interest of WSP. It shows the importance of raising awareness of the necessity of WSP implementation in the 2nd phase. Besides, it can be seen that the effectiveness of the water safety regulation issued by the Ministry of Construction (the Decision No.16/2008 QD-BXD on December 13th, 2008 by the Ministry of Construction) is not high enough and it is not compulsory but encouraging only.

All of the companies affirmed the necessity of WSP and that the WSP regulation was an initial important legal base to implement WSP at urban water companies in Viet Nam. However, there were other opinions regarding the feasibility of QD16/BXD/2006 due to a number of reasons such as the legal inconsistency within the system, the unclear financial policy, and the co-operative possibility among relevant ministries and sectors…. Currently, we are informed that the Ministry of Construction, by which the regulation is issued, is collecting comments to supplement as well as revise the regulation. It aims to lessen the weakness and improve the legal effect of WSP and it is a really good movement. Nevertheless, due to the importance of water safety and its relation to different management agencies, We, VWSA, propose that state agencies, particularly the Ministry of Construction, the Ministry of Health, The Ministry of Natural Resources and Environment, the Ministry of Agriculture and Rural Development should consider the possibility of upgrading the regulation to an inter-ministerial circular.

The role and the support of local authorities

Only 40% of the companies said that WSP in their province received the attention from local authorities while WSP is not the sole responsibility of water service provider. One of many key steps in the road of WSP implementation in Viet Nam is to establish an institution in which the set up of a provincial WSP steering committee is necessary and there should be the participation of local authorities such as the Department of Construction, Natural Resources...
and Environment, Health and Agriculture and Rural Development. A lack of support from local authorities in the first phase showed that raising awareness and public dissemination about WSP have not deployed on a large scale from the central to local level. On that basis, it is seen that for the second phase, national conference to disseminate WSP to local authorities at all levels and relevant agencies should be organised and needs much attention to

**River basin and water resource management**

Water service is a sector which is affected dramatically by environmental bad effects such as flood, the salt intrusion as sea level rising, river pollution by solid waste or untreated waste water, climate change, .. Therefore, it needs a special attention to the monitoring of changes in the quality of water resources and active preventive measures. The application of the measures used in WSP implementation to detect pollution risk of water resource is very essential to ensure the quality of water resources. Although water companies are not responsible for river basin and water source management, they are encouraged to control, detect and promptly report to responsible agencies

The result shows that 100% of water utilities do not take the control in managing river basin as well as raw water resources. It poses the most serious risk, threatening the water supply system. It is also a common obstacle to the whole water sector in Viet Nam and cannot be overcome in the near future. Provincial steering committee and WSP team plays an important role in alleviating risks to water sources. On the other hand, WSP team of water utilities has to address hazards as well as preventative and mitigation measures

**Assembling WSP Board/ Team**

The result shows that although WSP has been implemented for 3 years in the first phase, only 50% of participating companies have assembled WSP Boards/Teams. This fact reflects that many companies have not yet realized the importance and benefits of WSP in general and the key role of WSP Board/Team in particular, in WSP implementation in a water utility.

**The water supply systems already had WSP manuals.**

Almost water utilities taking part in the first phase WSP did not have a complete WSP manual to cover all their water supply systems. Statistics said that 64% of the companies did not issue any complete WSP manuals. This did not mean that the companies have not yet implemented or accessed to WSP. However, it is impossible for water utilities to implement WSP methodically unless having a WSP manual. It is a remarkable concern during WSP implementation in the first phase and should be an experience for the training program of the 2nd phase. The fact that the companies had the interest in WSP implementation but not issue WSP manual reveals that there is a gap between the WSP training and implementing. Thus, the support, technical advice as well as closely monitoring from WHO and his partners is very vital.
Training and Technical Support.

The data about training program and technical support should be considered more seriously: 90% of the companies said that they were satisfied with the program and the content of WSP training courses organized by WHO in association with VWSA in the 1st phase. However, WSP implementation indicators of the companies such as making regulations, issuing manuals, addressing hazards, planning mitigation measures, updating the planning... were low. The reason might be the limitation in supportive materials which is an good lesson from the first phase and be helpful in compiling the training curriculum of the 2nd phase in which it is better to reduce general theory and increase practical exercises and widely introduce standard WSP manuals. That way of doing will then enable attendants, after the training, to easily implement from general guidelines.

The percentage of staffs getting the on-site WSP training from those who were trained at the central level was still low. Among questioned companies, for the first phase, an average of only more than 10% of the staffs had the on-site training and 35% of the companies participating the first phase did not organise internal training. Since the financial support from WHO is limited, if the companies want to increase the number of trainees, they should be active in organizing training workshops for themselves and their branches, using the training materials of WHO. However, the reason that the companies have not deployed on-site training courses might be a lack of training materials which is nationally standardized. Partners of WHO should pay attention to this point in the 2nd phase WSP implementation.
Almost water companies (95%) agreed that the improvement of water resource and quality control of treated water are the most critical issue that needs priority while implementing WSP. The other issues such as network distribution improvement, training, machanism and policy renovation,.. are also assessed to be important. It means that the core of WSP has not been fully acquired by water companies because the top priority should be the indetification and assessment of risks. After that, measures should be figured out to control and reduce the risks. If the lectures of the training courses in the first phase did not emphasis that, it should be caught more attention while compilling the training material for the second phase.

Although the WSP implementation of water utilities in Vietnam, through the assessment, somehow did not reach the expections, the overall assessment is that the WSP implementation in Vietnam has made an important contribution to the awereness and working out active preventive measures for water companies. In the first phase, just only 2 pilot-model achieved positive results. However, there are some new factors such as Nha Trang, Hai Phong, Vung Tau, Binh Duong, Da Nang, .. which are a promise for the study of a consistent application and development in terms of theory, methodology, policy, communication and customer relation during the implementatation of the second phase.

VIETNAM WATER SUPPLY AND SEWERAGE ASSOCIATION (VWSA)
ANNEX

Questionnaire forms collected from Water Supply Companies participated in WSP Phase 1