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**MINISTRY OF  
CONSTRUCTION**

**MINISTRY OF  
AGRICULTURE AND  
RURAL DEVELOPMENT**

**NATIONAL RURAL  
CLEAN WATER SUPPLY  
AND SANITATION STRATEGY  
UP TO YEAR 2020**

August 2000



## **FOREWORD**

The National Rural Clean Water Supply and Sanitation Strategy up to year 2020 has been produced by the Ministry of Construction in co-operation with related Ministries and Branches during the years 1997 - 1998 with support from Danish International Development Assistance (DANIDA). It is a product of a study group consisting of the National Project Manager, the Chief Technical Adviser and International and Local Consultants. This report is the result of extensive discussions with sector stakeholders and persons who are interested in the field of Rural Clean Water Supply and Sanitation in Vietnam.

The strategy report was edited and updated, for submission to the Prime Minister for approval under Proposal No 34/TTTr/XD-NN & PTNT dated October 27<sup>th</sup> 1999, jointly by the Ministry of Construction and the Ministry of Agriculture and Rural Development. Subsequently the Prime Minister issued Decision No 104/2000/QD - TTg on August 25<sup>th</sup> 2000 approving the National Rural Clean Water Supply and Sanitation Strategy up to year 2020.

The National Rural Clean Water Supply and Sanitation Strategy up to year 2020 has been revised by the Ministries of Construction and Agriculture and Rural Development to include the comments and ideas in Decision No 104/2000/QD-TTg.

This is an unofficial translation (into English) of the official version (in Vietnamese) of the National Rural Clean Water Supply and Sanitation Strategy up to year 2020.

In this translation, the Vietnamese terminology has been followed closely and pagination follows the Vietnamese version for easy reference.

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## ABBREVIATIONS

in this English version

<b>CERPAD</b>	Centre for Residential Planning and Development
<b>CERWASS</b>	Centre for Rural Water Supply and Environmental Sanitation
<b>DANIDA</b>	Danish International Development Assistance
<b>DARD</b>	Department of Agriculture and Rural Development
<b>DOC</b>	Department of Construction
<b>DOET</b>	Department of Education and Training
<b>DOF</b>	Department of Finance
<b>DOH</b>	Department of Health
<b>DOLISA</b>	Department of Labour, Invalids and Social Affairs
<b>DOSTE</b>	Department of Science Technology and Environment
<b>DPI</b>	Department of Planning and Investment
<b>DVC</b>	Double Vault Composting (latrine)
<b>GDP</b>	Gross Domestic Product
<b>GoV</b>	Government of Viet Nam
<b>HRD</b>	Human Resource Development
<b>IEC</b>	Information, Education and Communication
<b>KAP</b>	Knowledge, Attitudes and Practices
<b>LFA</b>	Logical Framework Approach
<b>MARD</b>	Ministry of Agriculture and Rural Development
<b>MOC</b>	Ministry of Construction
<b>MOET</b>	Ministry of Education and Training
<b>MOF</b>	Ministry of Finance
<b>MOH</b>	Ministry of Health
<b>MOLISA</b>	Ministry of Labour, Invalids and Social Affairs
<b>MOSTE</b>	Ministry of Science Technology and Environment
<b>MPI</b>	Ministry of Planning and Investment
<b>NGO</b>	Non Government Organisation
<b>NRWSS</b>	National Rural Water Supply and Sanitation
<b>NSC</b>	National Steering Committee on Water Supply & Environmental Sanitation
<b>NSSP</b>	National (RWSS) Strategy Support Program
<b>ODA</b>	Official Development Assistance
<b>O&amp;M</b>	Operation and Maintenance
<b>PC</b>	People's Committee
<b>PIP</b>	Public Investment Plan
<b>PMU</b>	Project Management Unit
<b>PSC</b>	Project Steering Committee
<b>QA</b>	Quality Assurance
<b>QC</b>	Quality Control
<b>RWSS</b>	Rural Water Supply and Sanitation - including towns up to 30,000 people
<b>SOE</b>	State Owned Enterprise
<b>SV</b>	Single Vault (latrine)
<b>TA</b>	Technical Assistance
<b>TOR</b>	Terms of Reference
<b>TTg 200</b>	Prime Minister's Decision setting out the approach/responsibilities towards RWSS
<b>UN</b>	United Nations
<b>UNICEF</b>	United Nations Children's Fund
<b>USD</b>	US Dollar
<b>VBARD</b>	Vietnam Bank for Agriculture and Rural Development
<b>VBP</b>	Vietnam Bank for the Poor
<b>VIP</b>	Ventilation Improved Pit (latrine)
<b>VLOM</b>	Village level operation and maintenance
<b>VND</b>	Vietnamese Dong
<b>VWU</b>	Viet Nam Women's Union
<b>WATSAN</b>	Existing national RWSS Program, with UNICEF funding

***WRAI*** Water Resources Administration and Irrigation (a section in DARD)  
***WSC*** Water Supply Company  
***WSS*** Water Supply and Sanitation

## INTRODUCTION

Safe water and environmental sanitation are basic needs of people's daily life and they have become urgent requirements for protection and improvement of people's health and living conditions, as well as for the cause of national industrialization and modernization.

The resolution of the 8<sup>th</sup> Party Congress has pointed out that it is necessary to "improve urban water supply and sewerage, and to supply more safe water to rural areas". The rural areas of Vietnam contain 75% of the country's population and agriculture remains a key element in the national economy.

People in rural areas are, however, generally poor and with the economic renovation policy they are tending to fall behind urban people, both in relative economic development and in relative overall quality of life.

The Party and the Government are focusing on and giving a high national priority to rural development and are now studying the Strategy for agricultural and rural development in the period of industrialization and modernization. The government also gives priority to rural water supply and sanitation (RWSS) development and has decided to make RWSS one of seven most important national target programs from now up to year 2005. A number of RWSS projects financed by the government and by international donors, such as the UNICEF program, are being implemented in different localities, and a greater number of WSS facilities are built by people themselves. However, these projects and facilities can only meet a very small part of RWSS demands of all people.

Currently, over 70% of rural population use water, which does not meet basic hygienic criteria and half of rural households do not have latrines. Water and sanitation related diseases such as diarrhea, intestinal worms and intestinal diseases are very common, accounting for the highest proportion of people's common diseases. Construction of WSS facilities has become a very crucial requirement over a large-scale area in the coming years.

In that context, a strategy providing long term and overall framework for RWSS development is needed.

RWSS is a very large concept and this strategy focuses mainly on the supply of clean water for domestic use and on the sanitation needs of households. The study scope of the strategy covers all rural areas in the country.

Being assigned the responsibility by the Prime Minister in the Official Letter No 6610/QHQT dated December 24, 1996 and with funding from the Government of Denmark, MOC has worked in coordination with MARD, MOH, MOSTE, MPI and the National Steering Committee for Clean Water Supply and Environmental Sanitation to study the National Rural Water Supply and Sanitation (NRWSS).

During 1997 - 1998 international consultants and Vietnamese experts carried out investigations to evaluate the current RWSS situation in 9 provinces representing 8 regions, studied and drafted the Strategy, discussed with different ministries and sectors and organized workshops at grass root, provincial, regional and national levels to collect comments and recommendations from users, rural communities, staff working at provinces and in different ministries and sectors and from social organizations and specialists of related disciplines.

The Steering Board for the NRWSS project included members from the Steering Committee for Clean Water Supply and Environmental Sanitation, MOC, MARD, MOH, MOSTE, MPI, Central VWU, Central Ho Chi Minh Communist Youth Union. The Steering Board has monitored and provided guidance during the whole process of studying the Strategy.

Based on the aforesaid study, MOC has drafted the NRWSS strategy up to year 2020. This strategy reflects the participation and contribution of different agencies and of experts from different ministries, sectors and mass organisations. MOC has coordinated with MARD to submit this Strategy to the Prime Minister for approval.

MOC would like to express its sincere thanks for the cooperation, assistance and enthusiastic participation of all ministries and sectors and for the effective assistance from the Government of Denmark in the study of this Strategy.

The following parts are the main contents of the Strategy.



## **1. THE EXISTING SITUATION OF RURAL CLEAN WATER SUPPLY AND SANITATION, CHALLENGES, PROBLEMS AND OPPORTUNITIES**

### **1.1 EXISTING SITUATION OF RURAL WATER SUPPLY AND SANITATION**

#### **1.1.1 General Situation**

At present most people in rural areas are small scale farmers who live in nuclear family households with an average size of 5 people, in relatively population concentrated hamlets and villages with firm administrative units and long-lasting community traditions. Their living standards are still low and a considerable proportion of the rural population can be classified as poor people whose income can only meet the most basic needs of food and clothes. People's awareness of water supply and environmental sanitation is very limited.

In 1997, the Government proposed the Orientation for Rural Development which includes five main points:

1. Making investment to expand the areas for cash crops and for afforestation. Promoting the development of livestock breeding, forestry, fishery and handicraft production.
2. Increasing the proportion of government budget, ODA and local contribution in investment to develop social and physical infrastructure.
3. Creating more favourable conditions for the development of business and trading in materials, agricultural products and goods, promoting the partnership between SOEs, small retailers and farmers.
4. Promoting the application of new and modern equipment and technologies in rural production and processing.
5. Giving support to households who join cooperatives in a new mechanism, being more flexible in issuing certificates of land use and land tenure.

Currently the government is giving guidance to MARD to study and develop the Strategy for Rural Development in the period of industrialization and modernization. The main objectives are: to ensure national food security, with improved quality and composition of meals, for a population that will increase to 91 - 94 million people by the year 2010; to develop comprehensively agriculture, forestry, fishery production, salt production, processing industry, handicrafts and services in order to create more jobs and to increase rural people's income; to develop health care, education, culture, to build new, modern

and civilized rural areas which will maintain national characteristics; to ensure social security; to implement democratic regulations in rural areas; to develop rural infrastructure; to protect ecological environment and to mitigate natural disasters for sustainable development.

### **1.1.2 The Existing Situation of Water Resources**

In general Vietnam still has plentiful water resources, with high rainfall, a very extensive network of rivers, streams, canals and rich ground water resources in low lying areas. However, water resources are unevenly distributed both in place and time. Some areas face serious lack of water. The main problems are: the increasing use of surface water for rice field irrigation; serious impact of deforestation on water resources; ground water contains high amount of iron and manganese, requiring expensive treatment; saline water in relative large delta and coastal areas; increasing pollution of surface and ground water due to industrial and domestic wastes. In addition frequent drought is also a problem which needs more attention.

### **1.1.3 The Existing Situation of Clean Water Supply**

Most rural households use two water sources: one for drinking - usually rainwater, and one for washing. Public piped water supply schemes for a number of households are not yet popular. Households usually use individual household water supply facilities such as dug wells, rainwater jars or rain water tanks. Over 50% of rural households use dug wells, 25% use untreated water from rivers, streams, springs, lakes or ponds and over 10% use rainwater. Others use tube wells and a small percentage are supplied by piped schemes.

Dug wells are usually traditional open wells. Rain water is stored in jars or tanks, usually without covers, and using bucket or scoop for removing water. Tube wells are small in diameter and use hand pumps. Water quality generally does not meet hygienic standards. About 30% of households are estimated to have water supply systems that meet their relative basic domestic quality requirements, among them only 10% are supplied with water that meet national standards of clean water. In a number of areas people lack even the minimum amount of water for domestic use, not to mention the quality of water. These areas include saline areas, coastal areas, islands, high mountainous areas, remote areas, borders, karstic limestone areas, and recently the drought-stricken areas such as Thanh Hoa, Nghe Tinh, Quang Binh, Quang Tri, Hoa Binh, Cao Bang , Ha Giang etc.

### **1.1.4 The Existing Situation of Rural Sanitation**

About 50% of rural households do not have latrines: most people use the common practice of open defecation while others use a neighbour's latrine. Of the 50% of households that

have a latrine, most of these are the unhygienic single vault latrines or simple pit latrines with the excreta removed regularly for use as fertilizer. The next common types of latrine are double vault latrine in the North and fishpond latrine in the South, each type is used by about 10% of rural households. The small remaining proportion of households use pour flush latrine (Sulabh latrine) or septic tanks. Only about 20% of all types of latrines are hygienic.

### **1.1.5 The Health Situation**

When assessing health situation, the rate of under-one-year child mortality of Vietnam is a little better compared to some neighbouring countries (e.g. in 1993, the rate in Vietnam was 42/1,000 compared to 56/1,000 in Indonesia). However, the situation is worse if water and sanitation related diseases are considered (e.g. diarrhea has increased from 300 cases/100,000 in 1990 to 1,200 cases/100,000 in 1996 and 1,265 cases/100,000 in 1997. Intestinal worms and intestinal diseases are also serious problems, in some areas with up to 90% of the population having intestinal worms (in the Deltas, the Central Highland and in the North).

Only few rural people have good personal hygiene practices and in general people have low awareness of, and pay little attention to, the relation between water supply, latrine, personal hygiene practices and health.

### **1.1.6 The Situation of Construction of RWSS Facilities**

A major government RWSS program, funded by UNICEF, has been in operation for more than 10 years in most provinces, making an important contribution to the development of RWSS: over one hundred thousand wells with hand pumps and latrines have been constructed. At the same time people themselves have also constructed two or three times as many RWSS facilities, which has improved considerably the situation of RWSS. However, the total investment by both government and people in RWSS is still very small compared to the needs of improved RWSS in our country.

## **1.2 CHALLENGES AND PROBLEMS**

### **1.2.1 Financial - Economic Challenges**

- **Living standards of rural people are generally very low** and the rate of poor households is relatively high (according to government report before the National Assembly 5th Session in May 1999, the rate of poor households in the country in 1998 was 17%). According to MOLISA by the end of the year 2000 this rate will be

reduced to 11% with income of only 13 kg of rice/person/month, which means that income is only enough for food and there is no money for expenditure on other needs.

- **Investment in RWSS is very low:** on average during 10 years of economic renovation, government and donors have invested only USD 0.13 per person per year or USD 1.3 per person over ten years. Compared to the need of RWSS basic investment of about USD 15 per person, government and donor investment is only 1% of the sector demand.
- **RWSS coverage is low:** with only 30% of rural households having water supply systems and just 20% of rural households having hygienic latrines.

### 1.2.2 Challenges in Social Aspects, Traditions and Customs

- **Understanding about hygiene and health is low in rural areas.** Most people do not pay much attention to hygiene, considering it personal matters, more relating to convenience rather than a public issue affecting community health and the cleanliness of environment.
- **Due to bad hygiene practices common diseases are frequent in rural areas,** epidemics such as cholera and typhoid sometimes break out, making poor farmers poorer.
- **Use of fresh excreta as fertilizer is common** in the red river delta and central coastal areas. In the South, especially the Mekong Delta, fresh excreta is used as feed for fish.
- **RWSS organisation is fragmented,** coordination between different ministries and sectors is poor. MARD is responsible for water resource management and rural water supply; MOC is responsible for urban supply including class V towns; sanitation is the responsibility of MOH, although MARD and MOSTE also have their responsibility in sanitation. Environment is related to even more ministries.
- **Supply- driven approach** with no government policy to mobilise different economic sectors, together with users, to participate in and contribute to construction of facilities.
- **Weak legislative environment,** with a lack of specific regulations and guidelines for the good management of RWSS.

### 1.2.3 Technical Challenges and Natural Disasters

- **In especially difficult areas for water resources** such as saline areas (it is estimated that over 13 million people live in these areas); in the high mountainous areas and the karstic limestone areas there is usually lack of water resources and people have to take the water from distant springs, these areas are characterized by very deep ground water resources and there is little or no surface water.

- **Recent irregular climatic changes** have caused floods and droughts to occur in many localities, resulting in more difficulties in water resources. In some places exhausted water resources have become a serious problem for production and for people's lives, which requires special and urgent solutions.
- **Most households do not have hygienic latrines**, and a proportion of population living in the flooding areas use unhygienic fishpond latrines, but there is no proper alternative technological solutions.
- **Fishing villages have very high population density** but they lack safe water and there are no latrines. Environmental pollution is a serious problem in handicraft villages.
- **Pollution caused by livestock and pesticides** is also a major problem which requires separate studies and solutions.
- **There are no centers for technology transfer**, production and supply of materials and equipment for RWSS.

### 1.3 OPPORTUNITIES

Beside the challenges and problems, there are also opportunities in RWSS as follows:

- **The Party and the Government's attention and priority** are reflected in Direction No 36 of the Politburo on "Strengthening environmental protection in the period of national industrialisation and modernisation", in the National Target Program for Clean Water Supply and sanitation, in the establishment of the National Steering Committee for Water Supply and Sanitation at central level and in provinces, in the Prime Minister's Direction No 200 TTg on RWSS and in many other government documents, which show the importance and priority given to the sector. The government is now focusing on rural development, considering it a national priority, and is in the process of studying the Strategy for rural development in the period of industrialisation and modernisation.
- **The system of organizations** operating in RWSS has been extensively and well-established in all provinces through the UNICEF assisted program for RWSS. This is an important premise for the development of the sector in the future.
- **The well-established administrative decentralization** is also an opportunity for speedy implementation of RWSS programs and projects at the lowest level.

- **Rural economy is transferring into market mechanism** and farm economy with demand responsive approach and strong development of private sector, creating conditions for abolishing subsidy mechanism and for socialization in RWSS.

Apart from that, attention and support given by international organisations, bilateral and multilateral donors and NGOs.

#### **1.4 DEVELOPMENT PERSPECTIVE**

There has been substantial national economic development over the last 10 years of renovation, including development in rural areas. Economic development in 1998 was slower, partly because of widespread financial crisis in South East Asia. Up until now rural development has mainly been achieved through increased agricultural development, particularly higher rice yields. However, policy makers who are formulating the Strategy for rural development in the period of industrialisation and modernisation have pointed out that rural economic development must be done in a comprehensive way: food production, development of industrial crops and vegetables to supply enough material for processing industry and making livestock breeding one of the key production sub-sector, development of processing industry for agro-forestry products and development of rural industry, development of handicraft production, rural trades and rural services. This orientation will result in a policy of developing small urban areas into rural centers, bridging between cities and rural areas and actively promoting rural development. In the future there will be more and more people living in small towns; the scattering residential sites will conglomerate into residential clusters with population of over 1000 people and higher.

The National Rural Water Supply and Sanitation Strategy will be implemented within the framework of the general policies of the government and will be closely connected with the Strategy for Rural development.

The main government policies that affect RWSS are:

- That rural living conditions shall be improved, and in particular for RWSS: most people should have access to clean water; there should be improved rural environmental sanitation, this including stopping the use of fresh excreta as fertiliser, and achieving a "Clean, Green and Beautiful" rural environment.

- Where feasible and economic, piped water systems need to be promoted in rural areas under the assistance of the government to make these systems more financially attractive.
- Rural households and communities shall take the main responsibility for rural infrastructure development (including RWSS) in accordance with the principle of sustainability. The government will play an active supporting role of management, providing guidance and creating favourable conditions.
- Implementation of RWSS shall be decentralised and the roles of the province, district, commune and village shall be very important in planning and implementing RWSS.
- RWSS will be implemented in accordance with the Dublin Principles, including: treating water as an economic and social good; having decision making and management at the lowest appropriate level; and emphasising the participation of women.



## **2. OBJECTIVES, COMMITMENT, UNDERLYING PRINCIPLES AND GENERAL APPROACH**

### **2.1 OBJECTIVES**

The NRWSS will contribute to the implementation of the Strategy for Rural Development in the period of industrialisation and modernisation with the following development and immediate objectives:

#### **2.1.1 Development Objectives**

##### **1. Improved Health of the Rural Population**

[By reducing water and sanitation related diseases through improved water supply, latrines and the promotion of hygienic practices of people]

##### **2. Improved Living Conditions**

[If water supply and sanitation facilities are improved and developed they will provide a major benefit to improve rural living conditions and reduce the gap between urban and rural areas, thereby contribution to the promotion of rural and agricultural industrialisation and modernisation]

##### **3. Reduced Environmental Pollution from Human and Livestock Excreta**

[Reduce to the lowest level untreated human and livestock excreta which cause environmental pollution, smell and flies and reduce organic pollution of water resources].

#### **2.1.2 Immediate Objectives**

To achieve the above development objectives the following immediate objectives must be implemented:

##### **By Year 2020**

- All rural people will use clean water of national quality standards with at least 60 litres/capita/day and use approved hygienic latrines through the active promotion of community participation and a demand responsive approach.
- Universal good personal hygiene practice of rural people and good environmental sanitation of communes and villages through focused IEC.

### **By Year 2010**

- 85% of rural population will use clean water with 60 litres/capita/day
- 70% of rural households will have approved hygienic latrines and have good personal hygienic practices.

In the immediate years emphasis will be focused on:

- Concentration of all efforts so that by 2005 at the latest all kindergartens, schools, hospitals, markets and public utilities in rural areas will have adequate clean water and approved hygienic latrines.
- Giving priority to the urgent needs of domestic quality water for those areas lacking of water, such as drought-stricken areas, border areas, islands, high mountainous areas, remote areas, saline areas and those areas suffering from polluted water resources such as flooding areas and areas affected by industrial waste water discharge.
- Protection against water resource exhaustion and pollution, protection of quality of ground water and surface water in lakes, ponds, springs, streams and rivers.
- Ensuring sanitation in household or large-scale livestock breeding and in handicraft production of professional villages in order to maintain good rural environment.

## **2.2 COMMITMENT, UNDERLYING PRINCIPLE, GENERAL APPROACH AND SCOPE OF IMPLEMENTATION**

### **2.2.1 Commitment**

- Enhance the internal strength of rural population basing on demand responsive approach and socialisation of investment, construction and management; and at the same time increase the effect of state management of RWSS service providers. Users will decide on the type of RWSS facilities suitable to their capability of finance, operation and management. Government will take the role of providing guidance and support and there will be policies to help the poor, the social policy target households, ethnic minority people and areas with extreme difficulties.
- Develop a market for RWSS services under the government's orientation.

### **2.2.2 The Basic Underlying Principle is Sustainable Development.**

This principle places great emphasis on firm and steady development: all planning and implementation activities shall give high priority to sustainability rather than to other factors such as speed of implementation. At the same time it must be ensured that immediate

development shall not produce harmful effects for the future and water resources shall be reasonably exploited.

*To achieve sustainability it is necessary to:*

- Ensure adequate and timely financial resource, not only for construction of the facilities but also for management, operation and replacement of the facilities at the end of their service life (financial sustainability)
- Have clear ownership so that owners are interested in protection of facilities and in continuous utilisation and prolonged service life of facilities (utilisation sustainability)
- Ensure the ability of continuous and prolonged operation of facilities. This means there must be management system (even a very simple one), appropriate technology, staff capable of operation and maintenance of facilities, the network of repair services, and easily found spare parts (operational sustainability)

The application of this underlying principle of sustainability will face with many difficulties. International experience has shown that only when the users - in this case farmers - become the real owners of the facilities can sustainability be achieved.

However, for the users to become owners of the facilities the demand responsive approach must be implemented and a number of basic implementation guidelines must be followed.

### **2.2.3 General Approach**

The strategy will use a demand responsive approach, users will pay all the costs themselves and socialization of RWSS will be implemented.

**A Demand Responsive Approach** will replace the former supply-driven approach, which means that users, after being provided with necessary advice, will:

- Decide on what type of RWSS facilities they want, how they will organise this and how they will pay for them.
- Either construct facilities themselves or arrange and pay for a contractor to build the facilities.
- Manage the operation and maintenance of all the facilities.

Government agencies and donors will be providers of guidance, advice and support but they will not do all above tasks for users.

The demand responsive approach aims at enhancing to the maximum people's internal strength, and should be implemented the sooner the better, so that by the year 2005 all RWSS will totally follow the mechanism of this approach.

## **Cost Recovery**

As a general principle, users will be responsible for all construction costs and all operating costs for RWSS facilities. Government will however provide financial support in the form of grants to certain types of users and for certain technologies as follows:

- The poor, the very poor and the social policy target households who suffer difficulties.
- Full piped water supply schemes, which are promoted by government.
- A number of special cases.

In all cases users shall fund all operation costs and shall control all the actual payment for construction, operation and management etc.

**Socialization of RWSS** is to promote and to organise people, to create legal basis for the mobilisation of active participation and contribution of all economic sectors and all communities in financing, construction of facilities, production of equipment and spare parts, in providing repair services and in management and operation of facilities. Government encourages private sector to invest in and to construct RWSS facilities, in particular the full piped water supply schemes. The government management agencies will withdraw from WSS construction and business, and this will be given to state-owned or private contractors through competitive tendering. The market for RWSS services will be developed under the government's orientation.

### **2.2.4 Implementation Guidelines**

In order to apply the demand responsive approach and to achieve sustainable development, 5 implementation guidelines need to be followed:

- Users will decide on the selection of technology, site of full piped water supply scheme, level of service and operational arrangements they want. Government agencies will not do these for users but only implement the functions of management and providing advice.
- Users shall pay all construction costs and management and operation costs. Government only support the poor, the social policy target households and certain types of technologies that need promotion.
- IEC programs providing guidance to people for the understanding of technologies, techniques, operation and maintenance, financial mechanism, credit etc. to help them make correct decisions will start before the planning or construction of RWSS facilities.

- Effective operation and management arrangements of RWSS facilities that are intended to serve more than one household (for example full piped water supply schemes) shall be clearly put in place prior to construction of facilities.
- Advanced and appropriate technologies (technologies that: are easy to operate, use spare parts, equipment or materials produced in the country or locally; have been tested and shown to be sustainable; not too expensive and are acceptable to users; are environmentally acceptable) shall be promoted. Technologies, which are harmful for health and environment shall be rejected.

In steering of the Strategy if there is no firm determination to implement these guidelines resulting from basic underlying principle, the situation will reverse to the former supply-driven approach and sustainability will not be assured.

#### **2.2.5 Scope of Strategy Implementation**

Covers all rural areas of the whole country.

### 3. MAIN STRATEGIC SOLUTIONS

#### 3.1 IEC AND COMMUNITY PARTICIPATION

##### 3.1.1 The Importance and Aim of IEC

At present, the majority of rural population have little knowledge about sanitation, clean water, diseases and health, and about the fact that surrounding living environment should be, and can be improved.

It is experience from many other fields that if farmers are aware of these issues and problems, with the assistance from the government they can overcome difficulties and improve their own living environment.

Therefore information, education and communication (IEC) activities are vital for the success of all development strategies and the main future role for government is to focus on implementing IEC and management activities rather than directly involving in construction of RWSS facilities.

IEC activities will aim at the following purposes:

- Encourage an increased demand for clean water and hygienic latrines;
- Make full use of people's internal strength, increase their willingness to make financial contribution to construction of water supply facilities and hygienic latrines;
- Provide users with necessary and sufficient information to make informed choice between different WSS technologies;
- Create a much higher awareness of hygiene and of the link between sanitation, hygiene practice, water supply and health.

**Comprehensive IEC Activities at All Levels:** in order to achieve desired results, IEC activities will be large-scale and take place at all levels, with special attention given to the levels of commune and village. There will be information about health and hygiene, different technology options, funding support systems, and how households can organize themselves to apply for grants, for credit funds as well as to manage shared water supply facilities etc.

**Regional and Gender Considerations:** IEC activities will be designed to take regional differences in attitudes, customs, traditions, socio-economic conditions and literacy - geographically and ethnically - into account. On the other hand, IEC activities will pay special attention to gender issues, particularly to women, as they have the main responsibility for the collection and use of domestic water, and also for the hygiene and health of the family. However, it will also be important to reach men, who usually make the final decision about major household expenditures. In addition, attention will also be given to education of hygiene and health to children.

**Particular Emphasis on Latrines:** if there are no latrines, or latrines are not hygienic the clean water source will be polluted. Therefore IEC activities will give particular emphasis on promoting construction of hygienic latrines and proper use of them as well as on making people fully aware of the link between sanitation facilities, water supply and health. Attention given to sanitation in IEC activities will be materialized by giving people financial supports and by other activities such as construction of models of hygienic latrine and giving explanation of those models.

**Co-ordination and adequate funding:** in order to make IEC activities as effective as possible, a number of ministries, sectors and social organisations will be involved.

**The Vietnam Women's Union (VWU)** and MARD have the key role in IEC activities. Other relevant ministries and social organizations will co-operate with MARD and VWU in the implementation of IEC activities according to their responsibilities and functions.

MARD will be responsible for the integration of IEC activities with other activities to be implemented under the strategy such as providing technical and technological solutions, grants and loans as well as HRD activities. Special attention will be given to allocation of adequate funds for IEC activities; this is considered more important than support of funds for construction of WSS facilities.

Facilities at public institutions such as schools, hospitals, markets and other institutions used by the public are needed for three reasons:

1. Lack of such facilities will undermine IEC activities since words do not go with actions.
2. It shows people the sorts of facilities that are available and allows school children to put their health and hygiene education lessons into practice.
3. Public institutions are places where large numbers of people gather, without clean water supply and hygienic latrines there will be high risk of water and sanitation related diseases.



Constructing water supply and sanitation facilities at public institutions will therefore be one of the first priorities of the strategy and should be given financial support by government.

### **Key IEC Activities**

1. Face -to-face IEC activities will be very important. This will include the expansion of the network of RWSS motivators established by the VWU in close co-operation with the grass root health network, the Commune People's Committee, other community leaders and mass organisations. MOH will continue and enhance their IEC activities in relation to water, sanitation, hygiene and health through staff at commune health stations, village health workers and volunteers. Improved basic health education in schools is another key activity, aimed at changing the behaviour of the young generation. This will be combined with the construction of WSS facilities in all schools and other public institutions.
  
2. Beside face-to-face IEC activities there will be IEC activities implemented through other methods such as the use of:
  - Technical advisory services at district level
  - Mass media (radio, newspapers, television etc,)
  - National campaigns
  - Health education in schools

The IEC activities of the NRWSS will be integrated with the program of poverty alleviation in order to improve and to increase living standards of rural people.

### **3.1.2 Ability and Willingness to Pay**

One of the aims of IEC activities is raising awareness of people's responsibility of paying for clean water and hygienic latrines, so that they can enhance their internal strength to solve the problems themselves. At present an average household spends less than 1% of its annual income on water supply and sanitation. Meanwhile, the strategy assumes that in the future an average rural household could pay between 3% and 5% of its total income for clean water and sanitation. Following the principle of the strategy users will pay at least 50% of the construction cost and all the operating and maintenance costs for RWSS facilities. The ability to pay is very low among the poor who use most of their income on food, therefore the government will make financial support available for these groups so that they are able to afford to construct their own RWSS facilities. Other households will be assisted by loans from a RWSS loan fund.

### **3.1.3 Organisation of Community Participation**

The demand responsive approach means that most RWSS activities are organised and executed by users. Therefore, users will organise themselves into groups to do three main things as follow:

1. Helping one another in making financial contribution for construction of RWSS facilities
2. Managing piped schemes and shared latrines
3. Applying for government support in the form of grants or loans.

In these communities, special efforts will be made to ensure that both men and women participate in decision-making and are represented in the groups. However, it is encouraged by government that at least half of the group members are women and that they are given key positions within the group.

For individual household facilities, those households which do not have enough funds should apply for grants or loans as a group in order to simplify the administration procedures. The group will be jointly responsible for the proper use of funds. For individual households who have to finance part of the construction costs themselves the government encourages user groups to work as savings groups. WSS motivators will assist with the formation of user groups and support them in connection with applications for grants or loans and with monitoring the proper use of funds.

For shared facilities (mini piped schemes) users shall manage the facilities and form themselves into groups in order to apply for grants and loans, as well as to agree on and to organise the design, construction, operation and maintenance of such schemes. For larger piped schemes more formal arrangements are needed, but in any particular case users will play the role of owners of the scheme and must organise themselves to ensure they are represented in the management of the scheme.

### **3.1.4 Protection of Users**

The users are not RWSS specialists but will have to take the leading role as owners and managers of their own facilities. An adequate regulatory and support framework for management must therefore be established to protect users' interests in a market economy. This framework will have the following components:

- Regulations covering construction quality, water quality and the quality of chemicals for water treatment. Although a number of regulations exist they are incomplete and they also lack an adequate implementation and enforcement system. Implementation

of the strategy includes developing suitable detailed regulations and the associated enforcement systems.

- Professional guidance and checking to provide users with information of alternative RWSS facilities for their informed choice.

The protection of users is an extremely important part of the strategy because the basis of the strategy is user-centered, and it aims at enabling users to make the right decision, to manage contractors and manage the operation of piped systems. The relevant agencies will therefore place great emphasis on user protection and assist users to follow regulations and advice of government.

## **3.2 ORGANIZATIONAL STRENGTHENING, STRENGTHENING OF STATE MANAGEMENT AND HUMAN RESOURCE DEVELOPMENT**

### **3.2.1 Organisational Strengthening**

#### **General Principles:**

- Government bodies will not participate in production, construction or business activities. They only carry out their state management responsibility and provide advisory guidance to users.
- Build on the existing organisations including mass organisations and communities at the village level.
- Concentrate responsibility of steering RWSS implementation within one ministry: MARD
- There will be proper adjustment and clear division of responsibility among ministries, sectors, social organisations and good mechanism for co-ordination.
- Decentralise implementation to the lowest appropriate level working in close connection with community organisations.

#### **The Responsibilities of the National Level - Ministries and Social Organisations**

##### Responsibilities of the National Level:

- Setting policies, mechanism and plans for RWSS development and supervising and managing the implementation of these policies and mechanisms.
- Overall co-ordination of implementation of National Strategy, in particular close co-ordination between different ministries, sectors, social organisation and donors.
- Establishing credit funds, assistance funds to ensure adequate government budgets for the implementation of the strategy.
- Carrying out IEC and HRD activities to meet the demand of RWSS.
- Monitoring and evaluation of strategy implementation, updating strategy after every five-year plan to make it appropriate to reality and to new situation.

The responsibilities at national level are divided among main relevant ministries and social organisations as follows:

**The Ministry of Agriculture and Rural Development (MARD)** is the lead ministry to co-ordinate with other ministries in RWSS implementation, MARD is responsible for:

- Co-ordinating implementation of RWSS programs and projects
- Overall co-ordination of IEC
- HRD and training
- Pilot implementation and technological guidance
- Co-ordinating funds for grants and loans
- Co-ordinating the use of donors' funds for implementation of national programs according to priorities.
- Supervising implementation and updating of NRWSS
- Setting plans and steering implementation of plans for natural disaster mitigation.

**The Ministry of Planning and Investment (MPI) and The Ministry of Finance (MoF)** will have the responsibility of administering the allocation of funds, general co-ordination of funding and co-ordination of donor inputs, including the annual government budget for RWSS and for donor assisted projects.

**The Ministry of Health (MoH)** will have the key role in: IEC activities and raising awareness about hygiene and health, setting water quality standards and hygienic latrine, setting regulations on reuse of human excreta as fertiliser. MOH will also monitor water quality and sanitation facilities and monitor the implementation of quality standards for clean water supply and sanitation. MOH will have the responsibility to continue building up and to make full use of its extensive network at grassroots level to implement rural sanitary assurance.

**The Ministry of Construction (MoC)** will retain its state management function on capital construction, supervision and engineering adjustment of WSS facilities.

**The Ministry of Science and Technology and Environment (MOSTE)** will be responsible for research and development of advanced technologies solving difficult problems in RWSS, transfer of RWSS technology and environmental protection against pollution of water resources.

**The Ministry of Education and Training (MOET)** will have the responsibility to carry out research on integration of education of health, clean water supply and environmental sanitation into school education. MOET will co-ordinate with MARD, MOC, MOH, and MOSTE to set plans and programs for WSS training to meet increasing demand of society.

**Mass Organisations**, in particular the Women's Union will participate according to their functions in implementation of the National Strategy, especially in IEC activities, in mobilisation of community's active involvement in construction, operation and management of RWSS facilities, and in RWSS credit operation. Mass organisations will help users to form RWSS user groups or cooperatives.

### **The Responsibilities at Provincial, District and Commune Administrative Levels**

#### Provincial level

The Provincial People's Committee is the agency with highest mandate and responsibility to implement NRWSS in each province. PPC will establish appropriate organisations and structures at local level, prepare program and plan for RWSS, steer and co-ordinate different departments within the province and direct districts to implement RWSS program and ensure adequate provincial funding for this purpose. Another important responsibility of the provincial level is to co-ordinate with different ministries and sectors at national level and donors to attract funds and technical assistance for strong development of WSS.

#### District level

The districts will be the main level of implementation with the following functions: detailed planning and organizing implementation of WSS within the districts, giving advice to users about different technological options, mechanism and procedures for financial support or other kinds of support through district WSS advisory service centres, managing systems of grants and loans through banks at the district, giving guidance to user groups to manage construction and operation of piped scheme.

#### Commune level

Communes are the lowest grass root administrative level which is closest to people. This level will work in close co-ordination with individual users, user groups, mass organisations, in particular the Women's Union and banks to carry out most of government support function for RWSS. The commune level will act as co-ordinator and advisor to users, and organiser of implementation of commune's RWSS plan.

## Village level

Although villages and hamlets are not an administrative level they are the main units of rural residents in close connection with rural community. This level will be an important link between the commune level and users and will mobilise active participation of rural community in RWSS; at the same time village or hamlet will be the most appropriate unit for which mini piped scheme is built.

### **3.2.2 Strengthening the Effectiveness of State Management**

It is necessary to set up a favourable legal environment to mobilise the participation of different economic sectors and to manage well the activities in RWSS. Such a legal environment should have:

- adequate legal and regulatory documents
- an adequately strong machine for enforcement of laws and regulations
- policies to give incentives to agencies, enterprises, mass organisations and all people to observe laws and regulations.

Promulgation of the System of Improved Legal and Regulatory Documents will include:

- Promulgating supporting by-law documents for the implementation of the Law on Water Resources, Environment Protection Law and Law on Protection of People's Health;
- Adjusting the functions and mandate of relevant agencies and organisations in the area of RWSS in the Prime Minister's Decision 200TTg to update this decision to new situation and NRWSS;
- Promulgating policies which give incentives to socialisation such as: issuing permission, land allocation, tax, fees, loans, insurance etc. in order to encourage individuals and organisations to participate in development of RWSS following the orientation of government;
- Updating standards and detailed guidelines relating to RWSS such as standards of drinking water, approved hygienic latrine types, drilling procedures etc.
- Continuing to complete regulations on contracting and construction tendering which are suitable to characteristics of RWSS facilities to ensure equity for participation of all economic entities;
- Continuing to complete and to supervise the private sector's business environment;
- Promulgating regulations on user protection;
- Promulgating standards and guidelines regarding quality of supply of equipment, machines, materials and spare parts;
- Streamlining present process and procedures of planning, approval and financing;
- Promulgating the mechanisms for grants and loans;

- On the basis of typical conditions of the province, promulgating provincial by-laws on capital construction, environmental protection and health protection

### **Preparation of master plans**

On the basis of NRWSS, it is necessary to develop WSS master plans for rural residential areas, with adequate attention given to socio-economic conditions of each region.

### **Facilitating the participation of private and state owned enterprises**

The private sector and SOEs will be the providers of all RWSS construction and services in the future, therefore favourable conditions for their operation are needed, such as:

- Improving business environment so that private sector can compete with SOEs on an equal basis
- Strengthening private sector's capacity in technical as well as business skills
- Improving construction management systems so that construction contracts are tendered and managed in a fair and transparent way.
- Improving regulations to protect users to avoid private sector's potential misuse.

Water supply companies and SOEs participating in WSS will gradually assume more autonomy on asset management and financial matters. Private sector's business environment will be improved to provide them with favourable conditions to compete with SOEs on an equal basis namely:

- Taxation equality between SOEs and private companies
- Equal access to credit lines in the bank system
- Strengthening law enforcement on competitive tendering and contract awarding/punishment.

### **Arrangement for centralised water supply systems**

At present it is often the case that provincial water supply companies, District People Committees, or cooperatives are owners who invest in, construct and manage the piped water schemes, and now there are more and more schemes owned and run by a private investor. The real owners of the schemes, however, are users. To date there have not been clear regulations on the rights of ownership, supervision and management of operation of piped schemes and thus it is difficult to promote investment, construction and management of operation of piped schemes, which have many potentials of development.

Mechanism should be developed to promote the ownership of users in checking upon and supervise all operation of piped schemes. There will be policies to encourage investment, lending credit, and establishment of units having legal status such as cooperatives, limited companies to construct as well as manage and operate piped water supply schemes in rural areas.

### **3.2.3 Human Resource Development**

The Strategy requires substantial and fundamental changes in the way administrative and sector staff think and operate since they have to change from a central-planning, subsidized mechanism to a market mechanism and from a supply-driven approach to a demand-responsive approach. Beside the responsibility of training, the sector HRD will also include wider aspects such as staff recruitment and career development.

The aims of HRD are:

- To supply adequate number of sector staff and to make reasonable reshuffling of staff working in the sector to their professions and to the demand of future responsibility.
- To train national and provincial staff in NRWSS, understanding and skills in setting up plans and programs, co-ordinating and managing following the demand responsive approach for RWSS
- To train staff responsible for implementation at district and commune levels to do well their new job and new role.

#### **Commitment to HRD**

HRD will be targeted at the full range of staff in WSS, including senior national, provincial and district staff . Senior staff must fully grasp the new principles and approach of the Strategy. Staff at district and commune levels who are responsible for implementation must fully understand the strategy and have good skills to implement the Strategy.

HRD will be designed comprehensively for all types of staff: from steering, management, planning, programming; technical, financial, credit and banking staff to management, operation and maintenance staff.

HRD activities will focus more on practical skills than simply on theoretical basis. Attention will be given to the combination of on-the-job training, learning-by-doing



practical skills and traditional classroom training. HRD will be planned dependent upon need but should probably include the following:

- Planning and management for RWSS within a demand responsive approach.
- General information, education, communication and advisory skills.
- Multidisciplinary assessment of technical options, including feasibility studies.
- Financial planning and management.
- Supervising and evaluating project implementation.
- Specific technical skills, such as water resource evaluation, water quality testing, operation and maintenance etc.

Attention will be given to good remuneration policy to attract and keep good officials and staff to work at provincial and grassroot levels. The Government will encourage young staff to work at district level, value their experience of working at grass root level and will create good conditions for their career development.

There will be coordination of HRD of different ministries, sectors and organisations since each ministry or sector has its own training institutions. These institutions should give attention to training RWSS specialists and staff. Government, both at national and provincial levels must ensure adequate funds for RWSS training.

### **Strengthening the Training capacity**

At present most of the existing training institutions lack equipment and specialist trainers to train people in advisory skills needed for the new Strategy. It is therefore necessary to develop current WSS training capacity at all levels including tertiary training institutions, professional secondary education schools, vocational centres of MARD, MOC, MOET and other ministries.

## **3.3 RENOVATION OF FINANCIAL MECHANISM, MOBILISATION OF VARIOUS FUNDING SOURCES TO DEVELOP RWSS**

### **3.3.1 Mobilisation of Local Funding and Foreign Investment to Develop RWSS**

RWSS helps to improve people's health and to reduce diseases caused by lack of clean water and by bad sanitation, and helps to improve the living conditions for all households. This is the cause of all people, and it is therefore necessary to socialise RWSS and to mobilise various local funding sources, to enhance internal strength and to attract foreign funding for RWSS. These may include:

- Households spend a reasonable proportion of their income (3 - 5%) to invest in WSS facilities in the forms of: construction of WSS facilities for individual households,

groups of households or construction of piped water supply scheme for the whole village or commune.

- Government encourages private investors and other economic sectors to invest in construction of piped schemes by giving them special policy treatment, such as tax reduction or tax exemption, or loans with preferential interest rates. At the same time, government will have policy to protect investors.
- Government calls for foreign funding from multilateral or bilateral donors, from NGOs, in the forms of loans or non-refundable funding, including investment in WSS by private companies.
- Government spends adequate budget for RWSS in the forms of grants and preferential loans.

At present there are already a number of laws in full force and effect: Law on SOEs, Law on Private Enterprises, Law on Encouragement of Domestic Investment, Law on Encouragement of Foreign Investment, Law on Budget, Law on Banking, Law on Water Resources, Law on Environmental Protection etc.

Early promulgation of specific circulars, guidelines and clear policies of priorities is needed to encourage active investment in RWSS from local and foreign economic entities.

The financial mechanism to enhance internal strength is based on the principle of users paying most of construction costs, and all the costs of operation, maintenance and management of the facilities. There will be studies to set water tariff for piped schemes in a way that ensures financial autonomy of water supply companies (State-owned or private) and at the same time ensures user protection. However, in order to help poor people, social policy target households and those who live in areas with extreme difficulties the Government will have the grant and loan systems to assist them in construction of WSS facilities.

### **3.3.2 The Government's Grant System**

The Government's grant system is established with the aims of:

1. **Supporting Poor Households and Social Policy Target Households** with financial assistance for part of the cost of RWSS facilities. The government contribution for these households will be equivalent to approximately 60% of the total cost of a water supply facility and 50% of a sanitation facility on the condition that those households are willing to contribute the remaining costs and to ensure that the

WSS facilities will be well constructed, operated and maintained. For very poor households, the government contribution may increase to 80% for water supply facilities and 70% for sanitation facilities. For areas with extreme WSS difficulties such as areas suffering from drought, areas with scarce water resource, saline intrusion, high mountainous areas, areas with polluted water resources, flood-prone areas the Government will have special consideration to increase its level of assistance.

[It is estimated that currently there are about 20 - 25% of rural households which will benefit from government supported grant for the poor and social policy target households, and about 10% of rural households live in areas with extreme difficulties].

2. **Supporting Full Piped Water Supply Schemes:** which can ensure good water quality, sustainable development and convenient, handy use of water. These can make rural areas more civilised, help them move towards urbanisation and to reduce the gap between urban and rural areas. These schemes are very suitable for areas with high population density such as crowded villages and fishing villages in the plain, along coastal areas and suburban villages around large cities and towns.

[The process of rural agricultural development towards industrialisation and modernisation is also the process of changing the rural economic structure: crop farms and livestock farms, handicraft villages, industrial zones for agricultural product processing, commercial and service centres will be formed. Rural infrastructure such as roads, water supply, power supply, transport and communication will also develop. This will have profound impact on the process of population concentration; isolated, fragmented, dispersed residential points and nomadic farming people will congregate to form larger residential areas (over 1,000 people). Piped water supply schemes will meet the demand of such larger populated areas. Government (both national and provincial) will assist with the construction costs of piped schemes in the rural areas in order to encourage the community to contribute capital and labour to construct these facilities. The level of government contribution to individual schemes will be based on consideration of specific conditions and can be as much as 40% of construction costs during the immediate years and can be gradually lower for subsequent years].

Users can borrow from RWSS credit funds to contribute their part of construction costs. For the poor and very poor people in addition to government supported grant for construction of piped scheme they are still eligible for their special grants so that they are able to pay for their contribution to construction costs of piped scheme and house connections.

### **Special support**

Apart from the above two cases, users will generally pay all the remaining costs of operation and maintenance. However, for special individual projects government may choose to pay most of the costs up to an upper limit of 90%.

These special individual projects are very limited and are usually for the areas with extreme water supply difficulties such as drought areas, islands, high mountainous areas, borders, saline areas or to allow donors to contribute to particular areas if they choose to do so.

The total result of this division of costs is that government and donors will contribute approximately one-third of construction costs of WSS facilities. Users - which means farmer households - will pay two-third of construction costs and all management and operation costs.

Users will organise themselves into user groups or cooperatives on a voluntary basis to apply for government grants and loans. These groups will be jointly responsible for the correct utilisation of the money, and at the same time assist one another in construction of water supply facilities and hygienic latrines for individual households or construction of piped schemes. If follow up monitoring shows that the money is not used correctly the remaining households in the group will no longer be eligible for grants.

Payment of the grants will be channeled through the banks at district level, under direct guidance of commune PC and will follow regulations of DOLISA. Commune PC in coordination with mass organisations will certify eligibility of households for grants and will monitor their proper use.

### **3.3.3 The Government's Loan System**

Most of the costs for construction of WSS facilities will be paid for by users, and they will need to take out loans to pay for construction of facilities. The Government will set up a rural water and sanitation loan fund. Users will be expected to pay part of the construction cost as a deposit from savings (at least 25-30%) and they can only obtain loans of a maximum 70-75 % of total construction cost of facilities. The terms of loans will be from 3 to 5 years. The loan fund will consist of a central government fund and a provincial fund. This fund will lend to provincial and district banks at a lower rate than commercial lending, so that the interest rate charged by the banks plus management costs will still remain below commercial lending rate in order to encourage people to borrow for construction of WSS facilities. This is a kind of soft loan, which may have high level of risk in repayment, but the government should use a reasonable proportion of this type of loan for RWSS.

The Government will use bilateral ODA, soft loans from multilateral donors and part of the government's budget for credit fund with low interest rate to provide finance for this supported loan system.

The system of the Bank for Agriculture and Rural Development with its staff working at the grassroots level will take the main responsibility to provide loans for RWSS. The Bank for the Poor and shareholder banks can also participate in providing loans for RWSS, but they must co-ordinate with the Women's Union at district and commune levels in order to ensure good performance of revolving credit fund.

#### **3.3.4 International Assistance**

International assistance should be fully utilised. Donor funding for RWSS will be used for the following purposes:

- Technical assistance projects including preliminary studies and projects for pre-requisites such as IEC, HRD, setting up financial mechanism, pilot projects and technological guidance.
- Pilot programs of RWSS in focused provinces, which represent typical geographical regions and expansion from these programs to the whole country.
- Support to construction of RWSS facilities through financial support under the following categories:

General contribution to grant and loan funds: multilateral donors generally contribute to grant and loan funds; bilateral donors often wish to contribute to grant fund, especially for the poor. These funds will operate under clear and transparent regulations and will be closely supervised at all levels.

Specific schemes or area based projects. Donor may support a province to develop RWSS in the form of a program or a project, which is selected in accordance to donor's purposes and priorities. However, such program or project must follow the principles and financial mechanism of NRWSS.

Co-ordination of donor support will be done as follows:

1. Firstly at central government co-ordination level: MPI will co-ordinate donor support in programs following government's orientation.
2. At national implementation level: MARD will co-ordinate donor support to implement national program following priorities in RWSS and pilot RWSS programs.

### **3.3.5 Financial Mechanism**

NRWSS will apply two different types of financial mechanism:

- The normal government mechanisms for implementation of government plans, including budget allocation to provinces and allocation to central government departments for IEC, HRD, technological guidance and investment costs for construction of projects. MARD will co-ordinate with MPI and MOF to distribute the budget to ensure social equity and effective use of the budget.
- The special mechanisms for the grant and loan funds as above-mentioned.

Both types of mechanism must work on the same basis of enhancing internal strength, socialization and under market mechanism, which will be realised by specific policies.

## **3.4 RESEARCH AND DEVELOPMENT AND APPLICATION OF APPROPRIATE TECHNOLOGIES**

### **3.4.1 Research and Development**

RWSS research and development will be strongly promoted under the following principles:

1. Topics for research and development shall be based on clearly identified needs of the sector and shall also use a multidisciplinary and cross-cutting approach. In particular user attitudes and practices shall be taken into account and tested in research and development because users are the focus of the Strategy.
2. Pilot testing will be an important function of research and development and will be done as part of normal implementation of the Strategy.
3. Research will be done systematically:
  - Reconsider and improve traditional technologies;
  - Take into account international experiences, adopting and applying these experiences selectively. Research will not be limited to duplicating the results of international experiences but will further adjust and develop international research to the conditions of our country;
  - Encourage application of advanced technologies to make contribution to rural industrialisation and modernisation and to reduce the gap in WSS between rural and urban areas;

- Research will be done to develop typical models and to standardize different types of piped schemes of different scales using surface water and ground water in different regions. These models and standards will be introduced to people for their choice and application. Accepted model designs should be applied and produced in an industrial scale in order to increase quality, to reduce costs and to shorten construction period;
- Research will not be limited to technologies. It shall include approaches and systems for RWSS as well as IEC, HRD and management models;
- Encourage research and production of local equipment and materials for RWSS;
- Research will be carried out in disaster mitigation.

### **3.4.2 Choice and Application of Appropriate Technologies**

Presentation of different technologies to users is very useful because this will help them to have necessary knowledge and understanding to make their choice of a suitable technology. The presentation will have two components:

Firstly, assessment will be made on the relative advantages and disadvantages of all the accepted technologies in order to help users make their choice of a suitable technology for themselves. Single technologies will not be pre-selected or presented as the only option; instead a system of agreed positions on standards and the advantages and disadvantages of different technologies will be presented. Basing on the agreed positions and standards, the users will then decide which technology best suits their requirements.

Secondly, technologies that are dangerous to health shall be discouraged. In addition to the regulatory approach of banning certain technologies, IEC activities will inform users of the dangers of such technologies and promote appropriate behaviour.

### **3.4.3 Clean Water Supply**

#### **Popular Rural Water Supply Technologies**

In the future rural water supply will be developed by diversifying different categories of technologies which best suit the typical conditions of each region, such as:

- Tubewells or dug wells with or without treatment facilities, fitted with handpump or electric pumps or improved village wells for a group of households.
- Rain water jars or rain water tanks for individual households.
- Piped schemes with piped connections, supplying water for a number of households or for the whole village, commune or district. These piped schemes can be simple gravity



flow systems or systems using electric pumps. Depending on conditions of region, there may be connections to each individual household or only connection to public water tanks and public water taps. Piped schemes with electric pumps is an advanced technology approaching that of urban areas and will be strongly encouraged for districts, as well as densely populated communes and villages in which households live close to each other. It is estimated that by 2020 about 40% of rural households and households in Class V urban areas will be using piped schemes).

### **Water Supply in Areas with many difficulties**

**Water Supply in Saline Areas:** are vast areas including the coastal areas and islands. There will not be a common solution for all areas. One of the following solutions can be selected depending on typical conditions of each region:

- Rain water: usually for cooking and drinking.
- Using piped schemes or canals to bring in water from a non- saline area (if the saline area is near a non-saline area).
- Blending rain water from large tanks with saline water for washing purposes. Rain water will be used only for cooking and drinking.

In the future research and pilot testing should be done to treat brackish water into fresh water for water supply to saline areas.

**Water Supply in Mountainous Areas:** where poor minority people often live. Surface water sources are usually distant, ground water sources are very deep or there is no ground water. Solutions for water supply must be flexible and include the following options:

- Gravity piped schemes, if there is water source and the elevation is high enough upstream to allow water to gravitate to the village;
- Construction of small dams, lakes or ponds to store rainwater in the impervious valleys;
- Building rain water tanks and jars;
- Pumping water from the river, or finding small springs or limited ground water.

**Water Supply in Karstic Limestone Areas:** where ground water sources are usually very deep and there is almost no surface water. Water supply solutions can be:

- Deep ground water schemes: machine drilled wells;
- Finding surface water sources;
- Finding catchments and ponds in impervious valleys, protect them for use;

- Construction of natural or artificial surface water reservoirs with protection;
- Building rainwater tanks to collect rain water for cooking and drinking.

#### **3.4.4 Water Resources**

There is a need for improved understanding of water resources, for improved water resource management, and for considering that water is a rare and valuable natural resource. At present a considerable amount of information is available in the Ministry of Industry, MARD, MOC, in the National Steering Committee and in the provinces. This information needs to be organised and systematised at central and provincial level to allow for improved water resource management. The Law on Water Resources states that water resources for domestic water use shall have priority over all other uses and this needs to be built into the system of regulations for water resource management and development.

Rural water supply is a minor but important use of water because it requires water with high quality. MARD, therefore, needs to deal with the issue of the interaction of RWSS and the demand of other water uses, and in particular to pay attention to the issue of water resource protection against pollution. The RWSS sector will assist the water resources sector by jointly establishing a water resource monitoring system, which uses the data collected from RWSS implementation. Thus there is a need for investigations, management and protection of water resources.

##### **Water resources investigation**

Each province needs to set up a water resource database and an inventory system. Information collected from RWSS will be added to this database. There is a need of a detailed investigation of the reserve of ground water, surface water, rainwater, the potential for development, the amount already developed, the ability of resource recovery. The database would include a register of all major abstractors and all households and organisations that discharge significant quantities of liquid or solid waste into water resources. The polluter pays principle shall be applied.

##### **Management and protection of the water resources**

Each province needs to develop its plan for management and protection of water resources showing how each water resource will be developed and managed, how to prioritize water resource allocations, and especially contingency plans for droughts and other water resource emergencies.

There will be co-ordination between provinces to protect water resources in river basins, which run across different provinces.

### 3.4.5 Some Urgent Problems of Rural Sanitation

**Sanitation in Flood Prone Areas:** is a serious problem since a large proportion of rural population live in these areas. Fishpond latrines have been the traditional solution in the south and they are the cheapest types of latrines but there has been a ban on the use of such latrines. However, there is not yet an alternative solution. Thus MOH should coordinate with MARD and MOSTE to carry out study on appropriate solution.

**Sulabh Latrines:** are better types than traditional pit latrines; they are widely used throughout the world and they are being used in Vietnam. At present, there are different views of this type of latrine, therefore they should be studied to draw a proper conclusion in order to draw up guidelines to promote their use.

**Double Vault Composting Latrines:** have been used for a long time in Vietnam and have also been used and highly appreciated in many other countries. At present, however, there are still different opinions concerning this type of latrine. So there needs to be an assessment on the use of double vault composting latrines in different regions over the past years, and an improved solution to make this type of latrines reach hygienic standards.

**Reuse of Human Excreta as Fertiliser:** has economic implications for many farmers in agricultural production. Therefore, it is not possible to ban the use of human excreta as fertiliser. The important thing is to help farmers with guidelines on how to compost human excreta to get fertiliser without polluting the environment and causing harmful effect to human health. There should be regulations on standards of composted human excreta, process of composting, and a strict ban on the reuse of fresh (non-composted) human excreta.

### 3.4.6 Natural Disaster Mitigation

The situation of being inactive in natural disaster control has become more and more serious due to the lack of forecast information such as droughts and floods, causing huge damages, which have tripled within the period from 1960 to 1980. A number of developing countries have lagged behind during many years due to lack of investment in data collection and in preparation for natural disaster mitigation.

The forecasted climatic changes and the rise of sea level will increase the dangers, which threatens the safety of water resources.

The damages and difficulties caused by droughts and floods can be significantly mitigated by being actively prepared against natural disasters. In particular it is necessary to protect

and well-manage available water resources, to reduce water loss and to use water economically, to strengthen and upgrade reservoirs, to build dams on streams, to make gravity schemes, to dig old wells deeper and to drill new wells etc.

The successive serious flooding in the central provinces, in the Mekong River Delta and in the mountainous provinces in the North in recent years have posed great, urgent challenges to natural disaster control. At the same time, there must be studies on proper solutions to supply safe water and to ensure environmental sanitary for the natural disaster prone areas.

### **3.5 ISSUES NEEDING PARTICULAR ATTENTION DURING ORGANISATION OF STRATEGY IMPLEMENTATION**

The above-stated measures are general basic measures for all rural areas in the whole country. In the organisation of strategy implementation particular attention should be given to two following issues:

#### **3.5.1 Strengthening of International Cooperation**

In the trend of globalisation of the world's economy and in the context of our country's integration into the region and the world by its open-door policy international cooperation becomes very important for our country's development in general and for RWSS development in particular.

On the basis of enhancing our internal strength if we know how to expand cooperation and to make full use of international assistance it is possible to speed up and to implement better NRWSS.

It is necessary to strengthen international cooperation in RWSS in different forms: multilateral and bilateral cooperation, cooperation with NGOs, encouragement of private enterprises to invest in and to have joint ventures in the following fields:

- Exchange of experiences on organisation, management and policies and mechanism to develop RWSS;
- Human Resources Development;
- Transfer of advanced and proper technologies in RWSS;
- Funding, including non-refundable aid, soft loans etc

- Creation of favorable conditions to attract foreign investment in rural development in which there is rural clean water supply.

### 3.5.2 Considering Regional Differences

Vietnam is a large and varied country, which includes a considerable range of social, economic, topographic, and climatic water resource conditions. This National Strategy therefore needs to be appropriate for all of these conditions. The nature of this strategy is, however, to be demand responsive and decentralized, which means that users decide on technology and the amount they want to spend on RWSS facilities, and each province develops its own plan of implementation. The strategy will therefore need to account for the main regional differences through the demand responsive mechanism and through policies to be applied to the conditions of each region. Specific regional differences are dealt with as follows:

- Very poor areas (such as remote mountainous areas) will benefit more from grant fund.
- The additional cost of WSS facilities in remote areas or in areas with particular technical difficulties (mountainous areas, karstic limestone areas, saline areas) is dealt with by the increase level of grant.
- Areas with better conditions for economic development and better natural conditions, with favourable water resources have the option of higher cost technologies and higher service level with limited support from external sources.

The Action Plan includes a pilot program in the provinces and this will pay particular attention to developing appropriate regional guidelines. Some of the main differences in strategy implementation in different areas will be:

**Mountainous Areas** These areas usually have a high proportion of poor families. They will therefore receive a higher than average subsidy. They will also be particularly targeted for HRD since this is a major factor for the implementation of all programs in the region. IEC will take account of the special needs of the users, such as the lower than average literacy and the need to use ethnic minority languages. The main technical problem is lack of readily accessible water resources. In these areas there is very little, or even no ground water, and rivers or streams are usually in deep valleys. There needs to have many solutions to deal with water resources such as combination with irrigation to build reservoirs, growing forest to protect the watershed. Gravity piped schemes may will be built if there is water resource and the elevation is high enough upstream to allow water to gravitate to the village; Water from the river, or finding small

springs or limited ground water can be pumped to villages. Building rain water tanks is an option which can be widely applied in mountainous areas.

**Karstic Limestone areas**

The social and technical problems in these regions are similar to those of the mountainous areas. However the seasonal variation is more acute as water resources in these areas rapidly infiltrates into caves networks creating arid conditions. Technical solutions include: using deep ground water, leading water from other places, building small dams, lakes or ponds to contain rain water in impervious valleys.

**Red River Delta**

Very high population densities and the tradition of using human excreta as fertilizer make sanitation the greatest concern in this area. Implementation will therefore place particular emphasis on sanitation.

**Coastal Areas and Islands**

Salinity and high population densities in some fishing villages make water resources and sanitation the main concerns in these areas. According to estimation (1998) there are 13 million people live in these areas. These areas need to concentrate on evaluating water resource options and developing provincial water resource maps as well as developing various rain water impoundment systems. Main solutions include the use of piped schemes or building of canals to conduct fresh water from neighboring areas and rain water tanks.

**Mekong Delta**

Low topography, flooding, salinity, relatively fragile, easily polluted deep ground water resources are the main concerns. Particular emphasis should be placed on appropriate and sustainable technical solutions for this area. Sanitation in flood prone areas is a particularly important issue for about 16 million people living in this areas. Proper model of hygienic latrine must be developed to replace the fishpond latrines which are causing sanitation problems and environmental pollution.

The expansion of international cooperation and accounting for regional differences are very important for successful implementation of NRWSS, particularly the Action Program to the year 2005.



#### **4. THE ACTION PLAN UP TO YEAR 2005**

The NRWSSS has been drafted in the context that for many years a number of national programs and projects for RWSS are being implemented and the National Target Program for RWSS, approved by the Government on December 3, 1998 would be implemented from 1999 to 2005.

NRWSSS's basic underlying principles: sustainable development, demand responsive approach and socialisation of RWSS, will provide guidance to the whole sector as well as all RWSS programs and projects.

During the period of 1999 to 2005 an action program will be needed to give support to capacity building, organisational and institutional reforms and technical assistance to create important pre-requisites for the implementation of the National Target Program for RWSS and other programs and projects, and at the same time to lay a solid foundation for the implementation of NRWSSS. Specifically there will be the need to:

- Adjust the existing RWSS programs such as WATSAN, ADB assisted program for rural infrastructure development and other RWSS projects to bring them in line with the basic principles and general approach of NRWSSS. The National Target Program for RWSS will also need to be implemented following the basic principles of NRWSSS;
- Implement with good results the existing programs and 15 pilot programs for RWSS in 15 provinces during the two years 2000 - 2001 and expand the implementation of RWSS program to other 46 provinces in the following 4 years in order to increase the proportion of rural population having access to clean water supply and hygienic latrines as stated in the proposed targets. These pilot programs must address the most urgent needs of water supply for people living in drought-stricken areas or areas facing serious lack of water. Lessons will be learnt in the implementation of IEC, HRD, organisational reforms and formulation of financial mechanisms.

#### **4.1 The Action Program up to year 2005 comprises the following major items:**

##### **Pilot Implementation in 15 Provinces**

Pilot implementation of NRWSSS will be carried out in 15 provinces during the first two years: 5 provinces in the year 2000 and 10 provinces in 2001.

##### **The aims of pilot implementation are:**

- To test the feasibility and the soundness of the Strategy, and at the same time to find inappropriate points which will need readjustment.
- To start the demonstration implementation of the Strategy in order to expand to other provinces, and at the same time to improve RWSS for the people in pilot provinces.

##### **Implementation activities include:**

##### **Selection of 15 pilot provinces.**

Criteria for selection are:

- Provinces which suffer from extreme difficulties in RWSS, which are usually subjected to droughts in their remote areas, in mountainous areas and islands; the rate of households having access to clean water and hygienic latrines is very low.
- Provinces are already selected by donors for assistance.
- One province, which represents typical natural, socio-economic conditions of each region. 15 selected provinces may represent for the Mekong Delta, the Red River Delta, the Northern Mountainous Region, the Midlands of North Vietnam, The Central Highland Region (Tay Nguyen), the Central Coastal Region, the Northern Central Region, and the Eastern South Region.
- Each pilot province will establish an agency for program implementation under direct guidance of PPC, with clear assignment of duties to different provincial departments following their functions and capacity. DARD will usually be the leading department.
- Following the basic principles and general approach of NRWSSS each province will develop RWSS program on the basis of its demands and its specific conditions. This will be an integrated program consisting of a number of components: IEC, capacity building, mechanism for mobilisation and use of funds, application and transfer of technology. It is necessary to set up annual plans and schedules for implementation of this integrated program.
- Each province will select the first three pilot districts. The criteria for selection of pilot districts may refer to criteria for selection of pilot province as mentioned above so that

districts which represent different sub-regions in the province will be selected, with particular attention given to districts which suffer from many difficulties in water supply, such as droughts or water resource constraints etc. The district RWSS advisory centre will be set up in each district and technical and professional staff will be trained for this centre.

- The system and methods will be developed for monitoring and evaluation of the pilot program, for annual review of results and for comprehensive assessment at the end of the second year with the aim to draw experiences in setting up and implementing RWSS programs in other provinces and to supplement and adjust NRWSS to reality.

#### **4.2 Expansion of implementation of RWSS program to 46 other provinces:**

After two years of RWSS pilot implementation in 15 provinces lessons will be learnt from the reality of application of the National Strategy's basic principles and general approach. Other provinces based on their socio-economic conditions and demands will set up their integrated RWSS programs and organise the implementation of these programs following stages and annual plans. 46 provinces can be divided into 4 groups, each group from 11 to 12 provinces, for annual implementation.

The RWSS programs of the provinces shall be within the framework of the national Target Program but they will follow closely NRWSSS guidelines, which reflect its principles, resulting in substantial and fundamental changes in the way sector staff and rural people think and operate.

The aim of the pilot programs and the RWSS expansion programs is to implement the immediate objectives of the National Strategy to the year 2005.

#### **4.3 Expansion of international cooperation.**

The main activities will include:

- Introduction of NRWSSS to donors to help them understand and support the development of this sector following the guidelines of the strategy.
- Introduction of technical assistance projects to pave the way for the 15 pilot provinces to mobilise their support for these projects and programs.

- Consideration of adjusting existing donor assisted projects and programs such as WATSAN, the ADB assisted program for rural infrastructure development which also includes RWS in order to make them in line with the Strategy.
- Promoting exchange of regional and international experiences in RWSS, receiving and applying advanced and appropriate technologies for RWSS for saline areas, mountainous areas, islands and flooding areas. Receiving and applying technologies for effective protection and development of water resources, for exploration and exploitation of new water resources in case of emergencies such as prolonged drought.

#### **4.4 Implementation of IEC Activities**

IEC activities are very important for the implementation of NRWSS. During the first 6 years it is necessary to complete the IEC program for RWSS in 15 pilot provinces and expand to other provinces.

Setting up IEC program in 15 pilot provinces and expanding to other provinces:

IEC program will include 6 components:

- General approach and guidelines on IEC
- Face-to-face IEC
- Mass media and national IEC campaign
- Health and hygiene education in schools
- Construction of WSS facilities in public institutions, hospitals, schools and other public utilities.
- The system for monitoring and evaluation of IEC results.

Surveys will be made to determine the objectives of IEC activities and to decide on content, methods and the design of proper IEC kits. Motivators at all levels will be selected and there will be a program to train and upgrade motivators' knowledge and skills, in particular for those who work at village and commune levels.

There will be a combination of different forms of IEC such as through radio and television, books and artistic works, through face-to-face IEC and by launching IEC campaigns at district, provincial and national levels. IEC activities on RWSS will be integrated with other programs such as family planning, poverty alleviation, settled agriculture etc.

An important IEC content will be demonstration of models of water supply facilities and hygienic latrines. IEC planning must be closely coordinated with other planning activities,

with formulation of feasible projects and construction of RWSS facilities in districts and communes.

Government will set aside adequate funds for IEC activities and consider IEC as a component of RWSS programs and projects. However, it is necessary to mobilise the participation and contribution of mass organizations, volunteer motivators and existing facilities to implement IEC activities.

#### **4.5 Organisational Strengthening and Management Capacity Building at All Levels**

The main responsibility for RWSS will be assigned to MARD as lead Ministry. There will be clear RWSS responsibility assignment to MOH, MOC, MOSTE, MOET, MPI, MOF, VWU and other mass organisations.

The management agencies, steering agencies of the National Target Program and NRWSS will be reorganised and their capacity will be strengthened. State management functions of management agencies will be separated from construction functions .

MOH's laboratory and monitoring system of water quality and sanitation facility quality will be strengthened so that technical units of MOH will be capable of evaluation of RWSS effect.

Organisational system at provincial and district levels will be consolidated and their capacity of planning, coordination and organising RWSS programs and project implementation in their localities will be strengthened.

RWSS service centres will be established at districts to provide services to users, such as RWSS technologies, operation, maintenance and management.

To implement the Dublin principle and Government's policy of decentralisation, RWSS implementation will be decentralised to the lowest appropriate level. Communities in communes and villages and women will play particularly important roles in the implementation of the NRWSS.

Organisational capacity strengthening at all levels will be implemented in the National Target Program and in provincial RWSS programs following the principles of this Strategy.

#### **4.6 Drafting and Promulgation of Legislative Documents**

Currently the Law on Water Resources, Law on Environment Protection and Law on Protection of People's Health are in effect. It is necessary to study and draft by-law documents, such as decrees, directions and circulars, and to amend and complete the existing legal documents, creating favourable conditions for implementation of the Strategy. These documents also include:

- Specific regulations on giving priority to rural domestic water supply, especially in case of conflicts between domestic water use and the demands for other uses.
- Specific standards and guidelines on RWSS such as drinking water standards, domestic water standards, process of ground water abstraction, drilling procedures, standards of approved hygienic latrines in different regions.
- Regulations to facilitate business environment for private sector, and for protection of users.
- Guidelines on and procedures for the formulation, appraisal and approval of RWSS plans, programs and projects.
- Specific guidelines on construction tendering and contract system for RWSS facilities (in line with Government's Decree on management of investment and construction tendering)

#### **4.7 Planning**

On the basis of NRWSS, master plans of WSS for residential areas in province, district and commune need to be developed which closely reflect water resource conditions, potential for resource mobilisation and demands of people in each region.

#### **4.8 Human Resources Development**

Identification will be carried out for the RWSS training needs at different levels, number and types of staff to be trained at commune, district, provincial and national levels, including retraining needs and new training needs required by future demands.

- For central and provincial levels there will be the need to train staff for planning, programming and formulating projects, and management and coordination staff.

- For district, commune and village levels there will be the need to train staff for planning, project implementation, management staff, drilling workers, technical workers for operation and maintenance of WSS facilities.
- For companies (private or state-owned) there will be the need to help them upgrade their capacity and skills to meet the demands of service providing and construction of WSS facilities.

Appropriate ways of training will be applied for each type of staff including long training courses at universities, colleges, professional secondary education schools, and vocational training schools, and short training courses, workshops and on-the-job training.

MOET will coordinate with concerning ministries to develop training programs, to supplement and update the training contents for WSS at University of Water Resources, University of Civil Engineering, Polytechnical University, the University of Architecture and at RWSS professional secondary education schools and vocational training institutions.

The capacity of training institutions will be upgraded including strengthening material and technical facilities and capacity of trainers.

Workshops and short training courses for different training topics and for introduction of international RWSS experiences will be organized.

There will be close coordination between training activities and use of staff. The effect of staff utilization in RWSS will be made.

#### **4.9 Financial Mechanism and Mobilization of Various Capital Sources in Society.**

From 2000 to 2005, financial agencies must implement the following main tasks:

- Drafting and submitting for government approval and promulgation of financial policies and mechanisms in order to mobilise the maximum capital from households, private sector and other economic sectors and government funds; attracting funds from bilateral and multi-lateral donors and NGOs for RWSS investment.
- Drafting regulations on establishment and operation of credit fund and RWSS supporting funds. Setting criteria for classification of poor households and social policy target households for government supported grant and procedures for grant allocation to these households. Setting criteria and conditions for government supported loan,

issuing simple but effective regulations and procedures for obtaining and repaying loan.

- Identifying organisations at central, provincial and district levels, which will be given the responsibility of handling government supported grant and supported loan. The Bank for Agriculture and Rural Development with its network to districts and its large number of staff may be the main agency responsible for loans but this agency must work in coordination with VWU at all levels.
- Supplying grants and loans in 15 pilot provinces during the first two years and then expanding to other provinces during subsequent years.
- Drafting and issuing regulations on water tariff framework and fee collection for piped schemes.
- Drafting and issuing regulations on evaluation and monitoring of funds for RWSS grant and loan at all levels with community participation.

#### **4.10 Research and Development and Application of Appropriate Technologies**

During the period of 2000-2005 emphasis will be placed on the following main activities:

- Develop a R&D program to deal with remaining technological problems such as fishpond latrine, sulabh latrine, double -vault composting latrine, water supply for saline areas, mountainous areas, karstic limestone areas, drought-prone areas and application of advanced RWSS technologies.
- Draft manuals on appropriate WSS technologies for different regional conditions to be introduced and disseminated to communities for their informed choice.
- Carry out case study research and standardize different types of water supply of different scales and different types of approved hygienic latrines to be introduced to people for their informed choice. The approved types of WSS facilities must be produced on industrial scale for quality improvement and reduction of cost.
- Draft manuals for water resource protection and guidance for water quality evaluation; supply equipment for institutions which evaluate drinking water and domestic water quality; strengthen the system of laboratory for testing and monitoring water quality and quality of WSS facilities.



- Promote the exchange and transfer of WSS technologies of the countries in the region and of developed countries to be applied in Vietnam, particularly for those areas requiring advanced WSS technologies.
- Promote application of biological technologies to reduce the amount of chemical fertiliser and pesticides, which pollute water resources and badly affect people's health.
- Promote local production of materials, equipment and spare parts for RWSS.

IEC will be used to introduce and disseminate RWSS technologies to rural households.

#### **4.11 Establishment of Common Database for RWSS**

At present RWSS data are available but scattered in different agencies of MARD, MOC, MOH, MOI, MOSTE, the National Steering Committee for Safe Water and Environmental Sanitation etc. It is necessary to establish a database on RWSS in MARD, which includes: water resources, WSS technologies, finance, organisations, WSS staff at all levels. This database needs to be frequently updated for formulation of WSS programs, plans and projects at each level.

MARD will be the leading ministry working in coordination with other ministries to develop master plan for integrated water resource development. This master plan will evaluate current situation of water resource development for domestic water supply for each region and each province and will make clear assessment of potential for domestic water supply in each region, which will become the basis for formulation of water supply program and plan of province. The master plan will also propose plan for fighting droughts or for other emergency situations relating to water resources.