

# VIETNAM



Food security should be linked closely with sustainable agricultural production. In agricultural production, water always plays the most important role, guaranteeing whether there is a good or poor crop. Through many generations, the four factors which have the greatest effects on agricultural production have been summarized and ranked by Vietnamese farmers as: "Water is first, fertilizer second, hard work third, and variety fourth". The Agriculture and Food Organization of the United Nations (FAO) also confirms that "Sustainable agricultural development depends on sustainable water use". According to the review of FAO two thirds (many studies show 90%) of the world's water resources coming from rivers, lakes and underground resources are used for irrigation, the rest for domestic and industrial use. In Vietnam, agriculture now uses over 90% of the total water resources available for domestic and industry.

Recently, the need for food has increased rapidly due to population growth. In order to produce more food, farmers have had to diversify their crops, increase productivity and expand cultivated land. Therefore an increase in the need for agricultural water has been inevitable. People have been more and more aware that their water resources are not abundant. Water is limited even if it can be reused. However it is very sensitive to environmental changes and easily polluted and deteriorated. Population growth and urbanization, strong industrial development and inappropriate exploitation and use of water are now the main causes leading to the deterioration of this important resource. Agricultural production uses more water than any other industry and will have to burden any negative impacts of this situation. FAO warns that the number of nations with a shortage of water will increase more and more and, by the year 2000, over 40 countries will be at risk of water deterioration. Therefore management activities should focus on exploitation, use and preservation of water.

At present, Vietnam is considered a country with plenty of water, having a total surface water capacity of over 2360 rivers and lakes estimated at  $8.5 \times 10^{11} \text{ m}^3$ . With a population of  $7.5 \times 10^7$  there are  $1.1 \times 10^4 \text{ m}^3$  per capita per year. According to world standards, our country ranks in the middle in terms of water resources ( $1 \times 10^4 \text{ m}^3$  per capita per year). As estimated, by 2010 our population will reach  $9.334 \times 10^7$  then the average volume of water per person per year. It will only be  $9.1 \times 10^3 \text{ m}^3$  and we will be at the threshold of nations with a shortage of water. Another factor in Vietnam comes from our neighbors. Vietnam is located downstream in nine international rivers. We have shared water with surrounding nations such as the China, Myanmar, Thailand, Lao and Cambodia. Accordingly, our water resource is materially affected by the water use of upstream nations.

Vietnam is now an agricultural nation. Our cultivated land is potentially about 1.1 to  $1.2 \times 10^7$  ha. Presently we are using  $7.5 \times 10^6$  ha most of which is to cultivate for rice. Water for agriculture in Vietnam now takes up over 90 % of the water for all purposes. In the near future, by 2010, water for agricultural production in Vietnam will still take over 80% of its water. So the sustainable use and management of water is important for national food security. The following statistics (Tables 1 and 2) show that water still plays an important role in agricultural development in Vietnam.

**Table 1.** The situation and forecast of water and land use in Vietnam by 2010

Year	1995	2000	2010
Types of land			
Country natural land area (ha)	33,000,000	33,000,000	33,000,000
Agricultural land	7,348,500	7,790,000	9,409,600
- Paddy rice	4,252,000	9,409,600	4,378,000
- Other cropping	3,596,500	4,240,000	5,031,600
Forestry land of all types	9,500,000	14,300,000	15,900,000
Other land	16,151,500	10,110,000	7,690,400

Source: The strategy of management and protection of water resource in Vietnam - The Water Resource and Hydraulic Works Department.

**Table 2.** Water requirement for agriculture and other economic industries by the year 2010

Year	1990		2000		2010	
	Water requirement	%	Water requirement	%	Water requirement	%
Agriculture	46,976	91	60,929	85	74,035	82
Industry and domestic use	4,659	9	10,96	15	15,918	18
Total	51,635	100	71,926	100	89,953	100

Source: The strategy of management and protection of water resource in Vietnam - The Water Resource and Hydraulic Works Department 6/96.

However, it is not easy to define the difficulties in the use of agricultural water if we only depend on the statistics mentioned above. In fact, because of the large difference between dry and rainy seasons, flows in dry seasons, depending on the area, is only about 15 to 25% of the total annual flow. With the aim to provide enough irrigation water for most cultivated land (except for land irrigated by rain water), we have to build thousands of works to control and regulate water with different scales. According to the statistics of 1996 from the Water Resource and Hydraulic Works Department of MARD, Vietnam has 75 large and medium irrigation systems, 743 large and medium reservoirs, 1017 dams, 4712 sluices, 1793 pumping stations and thousands of water canals with different lengths. In the Mekong delta, one of the two biggest rice producers of the country, there are thousands of kilometers of large canals, flood protection levies and more than  $1 \times 10^4$  small pumping stations. According to the report of the water sector, (relatively though), the value of this property reached over VND  $2.5803 \times 10^{13}$  (according to the 1993 price level). During the past 25 years, the water resource sector has made significant contributions to the increase of food in the half century from  $1.45 \times 10^7$  tons in 1975 to over  $2.9 \times 10^7$  tons in 1996 thus guaranteeing national food security.

Water is one of the important factors guaranteeing sustainable agricultural development. However, floods and droughts are natural disasters threatening people's life, poverty and the economic development especially agricultural production. Protecting and mitigating damages caused by disasters is one of the main interests of water resource management in our country. Along with the construction of a range of irrigation, drainage and flood protection works as mentioned above, through many generations, Vietnamese people have set up over  $5.6 \times 10^3$  km of river embankments, more than  $2 \times 10^3$  km of sea dikes,  $8 \times 10^3$  km of flood protection levies,  $5.9 \times 10^2$  banks,  $2.9 \times 10^3$  sluices under dikes to control floods and protect people's life and poverty, stabilized agricultural production on great deltas thus contributing to food security both nationally and globally.

The use and management of water for sustainable agricultural production and national food security have made progress. Vietnam has had a lot of good policies, strategies and much assistance from professional organizations, countries in the region and the world (FAO, ADB, WB, ICID..). From a nation with a shortage of food, Vietnam has provided itself with food and become one of the world's leading rice exporters.

However, it is not correct that all problems of sustainable water resource management and development have been settled successfully. We still have to face drought in dry seasons and floods in rainy seasons. Water resources continues to be polluted and deteriorated by the pressure of population growth and economic development. These challenges will become more severe in the future, causing instability and unsustainability in agricultural production thus affecting directly policies on national food security.

Learning from the experiences of many other countries and based on the practical situation in Vietnam, we find that it is necessary to improve and complete strategies and policies on sustainable water use and management contributing to agricultural development and national food security in the long term as follows:

- a. Institutional strengthening will help to ensure integrated management of our national water resources. It is important that the Government has approved and issued water laws. This is the most important legal framework that controls the use, management and protection of this precious resource. Along with the completion of legal documents on water resources, we should establish an appropriate organizational structure guaranteeing the integration and efficiency of state management of water laws. Disintegrated management of water law has a great impact on society and the economy. This is now a great concern of many countries in the region and the world such as

Thailand and Bangladesh. Establishment of basin water resource management agencies is one of the advanced organizational models that needs studying.

- b. Vietnam is located downstream on many international rivers in which the Red and Mekong Rivers are especially important. Participation in the international basin organization (Mekong Committee) and cooperation with upstream countries to develop and protect the water resources of these rivers is important in order to protect our rights.
- c. Upgrading and rehabilitating the existing water and flood protection works is aimed to use most efficiently their design capacity. This economic resolution is suitable with our economic conditions and also used by many countries in order to avoid wasting water. (At present, our works only use around 60% of their design capacity and waste water. For instance, the irrigation coefficient is 1.5 to 1.7 times higher than design level). The hydraulic water works are nationally in great poverty, being built through many periods. Many were built at the beginning of the 20th century (Bai Thuong, Do Luong, Yen Son), and most of the rest in the 60s and 70s. Due to their life expectation, exploitation as well as wars and lack of capital for O&M many are severely degraded.
- d. Investment in rehabilitating and upgrading the hydraulic and flood protection requires a large fund. Each year the state spends hundreds of billions of dong on these activities. Only in the period of 1994 - 2000, has our government signed treaties to borrow from the WB to upgrade and rehabilitate a small number of hydraulic water works in the north and the central part of our country. The capital borrowed is up to  $3 \times 10^{12}$  dong because these activities needed carrying out efficiently, guaranteeing their duration.
- e. Continue studying and applying advanced, efficient exploitation and management methods of hydraulic works of various countries. These methods include policy, organization, participatory management and protection.
- f. Continue with investment in building new works to serve the current needs and expand cultivated areas and flood control in order to meet increasing needs for water, food and energy. It is necessary to build water works in mountainous and isolated areas, in order to contribute to the reduction of poverty and alleviate hunger thus creating general food security. However, new works need studying carefully to avoid and minimize negative environmental and ecological influences. At the same time, they must be economically viable and of high quality and beauty, meeting regional and international standards and generating work for the future.
- g. Improve the capacity of staff and agencies in charge of water management, creating conditions to support our water management activities to catch up with the world standard.
- h. A well-known world expert in water management said that: "Water is an import factor making contributions to social stability and economic development of any community, any nation or any civilization." Accordingly, sustainable water management in terms of economics, a society and the environment will be an important part in developing sustainable agriculture in our country and guaranteeing national food security.
- i. Strategy for development of irrigation schemes and water resources management in Vietnam to the year 2010 will include the following:

#### 1. Challenges:

- a. Low initial investment (1,000 - 2,000) uncompleted constructions;
- b. Degraded constructions, some only reach 60% of designed capacity;
- c. Lack of water, security of construction not ensured;
- d. Management of irrigation construction at local levels are not in line with market mechanisms.
- e. One million upland people lack clean water. Only 30% of rural people have access to clean water.
- f. Planning for protection and utilization of water resources is not comprehensive.
- g. There are exhausted water resources in many places.
- h. Scattered and overlapping management of water resources between Ministries, Sectors and local level management by river basins has not yet been implemented.

## 2. Objectives for the year 2010.

- a. Ensure a clean water supply of  $7.2 \times 10^{10} \text{ m}^3$  by the year 2000 (agriculture  $6.1 \times 10^{10} \text{ m}^3$ ; industry and domestic use  $1.1 \times 10^{10} \text{ m}^3$ ) and  $9 \times 10^{10} \text{ m}^3$  by the year 2010 (agriculture  $7.4 \times 10^{10} \text{ m}^3$ ; industry and domestic use  $1.6 \times 10^{10} \text{ m}^3$ ).
- b. Ensure drainage for flooded areas; improve the environment and ecology.
- c. Red River dike system to ensure a stable flow of water and prevent flooding at high water.
- d. Create a sea dike system to withstand storms of 11-12 Beaufort and developed to prevent coastal areas from salt water intrusion.
- e. Ensure security from flooding of the Mekong River Delta areas.
- f. Establish irrigation from large river basins.
- g. Overcome water shortages in the HCM city - Dong Nai- Vung Tau triangle.
- h. Develop small and medium scale construction in mountainous areas and the Central Highlands.
- i. Complete construction to prevent salt intrusion and regulate the water level in the Mekong delta areas.
- j. Provide a basic water supply for  $1 \times 10^6$  people in upland areas.
- k. Strengthen scientific research, water resources management, and the capacities for planning, design and building of irrigation construction and the application of new construction materials.
- l. Complete the legal document system under the Law on Water Resources.

Priorities to strengthen the capacities for water resources management and irrigation schemes.

- a. Establish national strategies for water resources.
- b. Plan and construct river basin and irrigation systems towards to integrate the use and management by watershed.
- c. Establishing legal documentation.
  - i) Implement the Law on Water Resources.
  - ii) Decree on administrative sanctions in the water resources sector.
  - iii) Decree on the pricing of water.
  - iv) Revise the law on exploitation and protection of irrigation schemes and the laws on dikes, flood and storm prevention to make them compatible with the Law on Water Resources.
  - v) Prepare inter-ministerial circulars and regulations on water resource management and loss prevention.
- c. Establish water resource councils, management and planning agencies for river basins to investigate water resources.
- d. Investigate water resources in order to establish a data base.
- f. Train human resources.
- g. Issue licenses for the exploitation and use of water and emission of waste water.

## 3. Priorities for investment

- a. Construct multi-purpose irrigation schemes.
- b. Construction for flood regulation and reduction of losses by natural calamities.

- c. Construction to prevent salt intrusion
- d. Construction for waste water treatment.
- e. Construction for drainage of flooded areas.
- f. Improvement of existing irrigation constructions.
- g. Consolidation of systems of dikes and canals.
- h. Improvement of irrigation control system.
- i. Improvement of weather forecasts and information of natural calamities.
- j. Strengthen capacities to manage reservoirs.
- k. Establish to manage networks for waste water treatment.
- l. Provide clean water and hygiene in rural areas.

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