**THE SOCIALIST REPUBLIC OF VIETNAM**

**MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT**

**(MARD)**

**No 2 Ngoc Ha str., Ba Dinh distr., Ha Noi, Vietnam**

Tel : +84-4-733.5707 Fax: +84-4-733.5702 Email: cucthuyloi@yahoo.ca

# RIVER BASIN ORGANIZATION IN VIETNAM AND ITS CONTRIBUTION TO WATER RESOURCES DEVELOPMENT IN THE FUTURE

**(Presentation in the 1st General Meeting of the NARBO, Batu-Malang, Indonesia, 23-26 Feb, 2004 )**

**Dr. Pham Xuan Su[1], Le Duc Nam[2], M.E Le Quang Tuan[3]**

**Department of Water Resources - Ministry of Agriculture and Rural Development (MARD – Vietnam)**

## Abtract

***With consideration of Vietnamese Government, efforts of MARD and assistance together with support from International Agencies, the National Assembly of Vietnam has issued the Law on Water Resources and it come into effect on 1st Jan, 1999. Since the Law enacted, some organization have been established such as National Water Resources Council (NWRC), River Basin Planning Board (RBO) of three biggest river basins such as Red-Thai Binh, Dong Nai and Cuu Long in which integrated water resources development and management is the one of the most priority in River Basin Management.***

***This report concentrate on the orientation for activities of RBOs and its contribution serving for water resources development through River Basin Management in Vietnam.***

---

1 *General Director- Department of Water Resources, MARD, cum Vice chairman of River Basin Organization of Red-Thai Binh, Dong Nai and Cuu Long Rivers.*

2 *Deputy Director- Department of Water Resources, MARD, cum Deputy Director of General Office for RBOs in Vietnam.*

3 *Specialist, General Office for River Basin Organization in Vietnams - Department of Water Resources, MARD.*

## I. BACKGROUND

Vietnam is located in a monsoon tropical zone with a lot of sunlight as well as rain. The river system in Vietnam is entangled with 2360 rivers which are more than 10 km in length including 10 big rivers which have basin area more than 10,000 $km^2$. Annual runoff is around 848 billion m3, of which 327 billion m3 is generated within the country and 521 billion m3 comes from overseas countries. In rain season, total water volume takes account for 70-80% yearly water flow. Annual flow is concentrating in 3-4 months of mid rainy season, while in 3 months of mid dry season the surface flow is about 5-8%. Dry season is lasting 6-7 months, it only takes account for 20-30%. Besides surface water sources, underground water resources also have dynamic sources potential of 1.500m3/s. However, water source distribution is very uneven both in space and time. Therefore, draughts and water logging often occur with a more complicated and serious trends in most of areas of the country's territory.

As the result of renovation, industrialization and urbanization process, the demand on water resources in both quantity and quality is increasing rapidly in parallel wastewater is mainly untreated before discharging to water source. Therefore, in some areas, water is heavily contaminated, polluted and could not meet the demand of water utilization.

With consideration of Vietnamese Government, efforts of MARD and assistance together with support from International Agencies, the National Assembly of Vietnam has issued the Law on Water Resources and it come into effect on 1st Jan, 1999. Since the Law enacted, some organization have been established such as National Water Resources Council (NWRC), River Basin Planning Board (RBO) of three biggest river basins such as Red-Thai Binh, Dong Nai and Cuu Long in which integrated water resources management is the one of the most priority in River Basin Management.

## II. OVERVIEW ON SUCCESSES AND CONSTRAINTS IN DEVELOPMENT OF WATER RESOURCES BEFORE THE ISSUANCE OF THE LAW ON WATER RESOURCES

### II.1. Successes

***a. Good implementation of socio-economic development strategy, objectives.***

Development and management of water resources are being paid more attention to. Implementation in the right way meets socio-economic development objectives and the strategy of the country in each period. This is a big success, which significantly contributes to development of people and every socio-economic sector.

Development of water supply systems, being active in irrigation, drainage and flood protection facilitate to:

- Achieve national strategic results in development of foods production, stably increase in foods production, ensure not only the national foods security program, but also yearly export of over 2-3 million ton of rice;
- Diversify crops; develop subsidiary crops, fruit trees, industrial trees, and increase in agricultural product value per cultivated land ha.
- Meet requirements of transferring process of cropping patterns in every region, especially, meet more and more water demand for development of urban, industrial zones, tourism services and aquaculture, and facilitate to improve domestic waterway.
- Strongly exploit hydropower. Number of small and medium hydropower stations in tributaries as well as big works in main rivers such as in the Da, Chay, Se San, Dong Nai, Ba Rivers, etc. had been built and are supplying tens billion Kwh electricity every year for the national electricity network. Exploitation of hydropower in the main rivers and major tributaries of river basins had been investigated, studied and proposed in the planning and the pre-feasibility study

since 1960s-1970s. Currently, concerned agencies are preparing feasibility studies. It proves that the previous study results and proposals in the planning are reasonable.

***b. Implementation of natural disasters protection and mitigation strategy*** is successful. Awareness of natural disaster is being improved, especially for policy-makers at central and local levels. Awareness and responsibilities of community for management and natural disaster mitigation are also being improved.

Flood protection planning in the Red River delta, the Mekong River delta, in the Central region and Tay Nguyen (center highland ) were prepared and being completed time by time. Big flood protection systems are being constructed and strengthened yearly such as the dyke systems of the Red River – Thai Binh River, the Ma River, the Ca River, etc.; sea dyke systems, saline prevention sluices in the northern and northern central regions; embankments, flood release canals in the Mekong River delta; large reservoirs such as Hoa Binh, Thac Ba, Tri An, Dau Tieng, Phu Ninh, Thac Mo, Vinh Son, etc. to cut off flood for protecting people life, infrastructure, and production in big and important deltas of the country during heavy rains, floods.

***c. Water resources management.***

Legal documents issued including Law of Water Resources, Law of Environment Protection, Ordinance on Dyke Management and Flood Protection, etc. are advanced legal documents in the region, and very important for national water resources management, natural disaster and flood protection. Under-law documents such as decrees, decisions and circulars were also issued.

Water resources management as the planning is interested in. Exploitation, use of water sources is gradually consistent with the Law of Water Resources. Water sources protection is being strengthened to protect against pollution, exhaustion by inspection of manufacturing bodies which discharge waste into water sources, prevent excessive exploitation of water sources. During preparation of water sources use and exploitation plans, environmental impact assessments, flow

discharge determination, downstream environment maintenance, etc. have been carried out.

***d. Science and technology***

- *Investigation and design:* new technologies are applied, especially informatics software to calculate and evaluate water resources, to calculate water balance, hydraulics, stability, seepage, hydraulic structures, structures, to prepare economic calculations, drawings, project documents, data bank, and to measure and draw topographical, geological maps, etc. in investigation, planning, and design stages. Some advanced foreign standards on types of structures or new materials have been applied.
- *Construction:* new equipment is used, new technologies are applied, for example, new seepage prevention technology, foundation treatment technology such as use of digging equipment in betonies solution, grouting technology to protect against seepage at both ends, manufacturing technology of PVC material to produce coupling, small hydropower stations, trickle and drip irrigation equipment, lifting equipment of gates by hydraulic piston, etc.
- *Management, exploitation and operation:* observation, measuring networks, management and operation software of irrigation systems have been applied.
- *Flood protection and dyke management:* applying routing, hydraulic models for flood protection, prediction of short and long term floods, use of new structures and materials for bank protection, use of three-dimensional model for natural disaster protection, etc.

***e. Development of human sources.***

Human sources of the sector are developing rather quickly, thereby, many basic technical issues in actual production have been solved, in addition, basic surveys, planning, design, construction, operation and management of hydraulic structures, prediction, forecast, flood protection and natural disaster mitigation are also ensured.

## II.2. Constraints

### a. *Constraints in water resources development*

In recent years, studies, planning for integrated use of water resources have been carried out. However, the studies were mainly implemented to meet development requirements of agricultural sector; for other sectors, studies were still limited. Since 1990s, study conditions were better; supply of water for the other sectors was improved. However, it is still not in time, because production patterns are being strongly transferred, especially irrigation water demand for crops, industrial plants, aquaculture and salt production, etc. These constraints should be solved to timely serve requirements of change of production patterns and market. Some initial basic surveys have been undertaken, however, systematic programs to update database for management have not been identified.

Basic construction is also limited. In many new systems, only headwork and main canals have been invested, meanwhile, on-farm canal systems have not been invested, so design capacity is normally not ensured.

### *b. Management of water resources and works*

Although water resources management is much more interested in, however, it still faces many difficulties. Implementation mechanism of Law of Water Resources, Ordinance on Dyke and Flood Protection is not adequate and powerful. Further, state management capacity does not meet requirements, participatory in compliance with the law and the ordinance is still limited.

Exploitation and management of hydraulic structures are not relevant to the existing infrastructure, therefore, the structures are gradually degraded and exploitation efficiency is low. In many areas, capital, labor force, and technique are invested in construction of new structures, however, management, strengthening efficiency of the existing structures; management mechanism; especially investment mechanism and financial policy are not paid attention to. Management of the hydraulic structures at local level is not consistent with the present market mechanism, especially in uplands and Tay Nguyen (center highland).

Collected water fees are not enough for management, operation, and maintenance of structures. Hence, many structures are being seriously degraded, serving capacity is decreased, and only over 60% of designed capacity is ensured. In drought years, harvest is nearly fully lost. Safety of works is not high, especially for reservoirs. Currently, there are no active irrigation and drainage structures to serve over 1.3 million ha of rice in coastal saline areas in the Mekong River delta, drought severe areas in the central region, Tay Nguyen (center highland) and some flooded areas in the northern delta.

Participatory in development and management of water resources is very limited and partly reduced after the Irrigation Strengthening Program and easement of agricultural cooperatives, especially since starting of the market economy period. Many structures designed to irrigate rice now serve "poly-culture, diversification of crops" or supply water for aquaculture, tourism, etc. Therefore, these structures, if not improved and upgraded, will not be sufficient water. Many structures cannot irrigate fruit trees, industrial trees in uplands. Most of on-farm canal systems are not reinforced, advanced irrigation techniques and regimes to retain land, water are not applied.

***c. Technology, science activities***

Technology, science activities are still not in time. Flood forecast and warning, river training should be more invested in to achieve a high accuracy and forecast for a longer-term to effectively deal with difficulties and save money.

In the market economy, investment costs for technology and science are limited, so science research agencies concentrate on projects. Many scientific studies which have been accepted, but are not publicly applied, because theirs efficiency is not high, so they are difficult to be carried out. Infrastructure of the scientific studies is still low, and does not meet requirements of industrialization and modernization programs to develop and manage water resources.

***d. Human sources are limited.***

Human sources are limited because of:

- In general, activities of staff in the market mechanism is low, foreign language level is limited, especially English; ability to update and exploit technical information is poor; 23% staff have intermediate political level, 26.3% staff have been trained on management, 8% on administration and 11% on informatics.
- Distribution of labor forces between regions is not balanced. In many areas, especially in district agencies in mountainous and midland provinces, labor forces are not sufficient.
- Education and age: number of doctors below 35 years of age is very low, more than 60% doctors are over 50 years and mostly work in universities, research institutes and the ministry's departments. In provincial departments, there are no doctors, mostly.
- Skilled scientific staff and technical workers are not sufficient.

## II.3. Opportunities and Challenges

### *II.3.1 Opportunities*

***a. The Party and the Government is more and more interested in*** development and management of water resources, in implementation of rural-agricultural industrialization and modernization programs to ensure the national foods security program, to cope with increase of population and political variations in the world, to protect life and assets of people, of the country against natural disasters, floods, storms, to create a firm base for implementing the following goals: *stable development of economy, poverty reduction, especially in remote areas, boundary areas to stabilize polity, society and assure security and national defense.*

***b. Technical – economic conditions*** of the country are better. Investment in science and technology will be more feasible to solve many difficulties and

complexity in study, design, construction of water resources development structures and flood protection structures. Acceptance and application of advanced scientific technologies in the world to development and management of water resources is supported now.

***c. International cooperation in management and development of water resources***

With the effort of the United Nations organizations, in the Pacific Ocean-Asian zone, there were many activities coordinated with many countries regarding development and management of water resources. The World Bank (WB) and the Asian Development Bank (ADB) set forth policies on water based on acceptance of urgent requirements to have comprehensives and inter-sectorial solutions on water. Purpose of ADB's water policy is defined as follows *"to develop the concept that water is a kind of vital economic goods in term of society and should be managed carefully to maintain economic increase, equality and reduce poverty"*. ADB supports water sector improvement for some countries in the region, including Vietnam. The Southeast Asia Technical Advisory Council (SEATAC) of the Global Water Partnership (GWP) is strengthening activities in the region, closely coordinate with local entities to promote integrated water resources management (IWRM). Water Cooperation Associations in some countries were established on the basis of SEATAC's idea to exchange information and experiences in IWRM. SEATAC supports establishment of Action Programs and Capacity of the member countries to cope with water crisis in the region.

***ADB's Water Policy concentrates on the following main issues:***

- *Promoting nations to reform water sector;*
- *Supporting integrated water resources management;*
- *Improving and expanding water services supply,* focussing on water supply and hygiene (in both rural and urban areas), on irrigation, drainage and other sectors.

- *Encouraging water sources protection and improving efficiency of systems.*
- *Promoting regional cooperation and strengthening use of international and national water sources;*
- *Facilitating exchange of information and experiences in water sector.*
- *Improving administration* will be carried out by promoting decentralization, strengthening capacity and evaluation, monitoring, research and study at any levels, especially in the state sectorial agencies.

***ESCAP water programs focus on 3 main issues:***

- *Promoting instruments and methodology to prepare water resources development strategy planning* and summarizing experiences of the regional countries.
- *Supplying and supporting services* for developing countries to solve urgent demands in development and management of water resources.
- *Pushing up cooperation* between the member countries and closely coordinating between international organizations and the United Nations' organizations in relation with water sector.

***d. Cooperation development, advanced technology science transfer***

- Exchange of sciences, technologies in development and management of water resources between nations is increasing. Technical, technological science market is formulating as well as currency, financial market, goods market, labor market.
- Number of new advanced technologies, sciences in the country and in the world is and will be applied to improve production, products quality and efficiency.
- Labor forces of other national economic sectors are being strengthened thanks to investment in the last years, especially since 1991 to now and will be more invested in near future, will be developed and be a premise for industrialization and modernization, etc.

Interest of the Party and the Government, strengthening cooperation, interest of international organizations in the global and in the region for a goal: ***a world of water safety*** is concretized by programs, activities, cooperation policies, financial and technical supports as well as development of science, technology and information exchange relating to study, evaluation, use exploitation, water sources protection and protection from natural disasters, etc. These opportunities should be caught and utilized to develop and manage the national water resources.

### II.3.2. Challenges

- ***Water resources start degradation*** and are continuously affected by destroying forests, pollution and global climate variations. Natural disasters, floods, drought, saline intrusion, flooding, tidal wave, water sources pollution, etc. are increasing day by day and become severely, threaten regularly and cause serious damages for people and assets in the country.

- ***Economy is increasing*** continually; water demand of socio-economic sectors will be increased more and more. In order to solve conflicts of water demand between sectors, there should be reasonable solutions and adjustments to ensure water demand, achieve socio-economic development objectives of the whole country, and develop industrialization and modernization.

- ***Pressure of population and life quality will be increased*** in several future decades. In 1999, population of the whole country was 76.3 million people, urbanization percentage was 23.5%. It is predicted that in 2050, population will increase up to 100 million people and stabilize within 2-3 next decades. Because of increase of population and improvement of life quality, water demand for production development, firstly clean water demand for domestic uses will be big challenges, especially for development and management of national water resources.

- ***Conflicts of water rights of countries along international rivers*** are increasing time by time. Water sources of international rivers such as the Red River, the Mekong River will be changed strongly and disadvantageously for the country because exploitation of the countries at upstream is a big challenge and potential on water sources conflicts.

- ***Conflicts of rights relating to water sources between local areas,*** especially in inter-provincial, inter-district irrigation systems arise and will increase.

- Because of the above-mentioned challenges, the water resources sector should have reasonable development and management solutions of water resources, reasonable exploitation of irrigation systems to ensure sustainable development, public benefits and equality between local areas and sectors.

## III. ORIENTATION FOR RBO's ACTIVITIES TO SERVE FOR INTEGRATED WATER RESOURCES DEVELOPMENT IN RIVER BASIN

### 1. Legislative document for RBO organization arrangement:

In the process of administrative reform, the Government structure was changed so that it effects on the operation and activities of river basin organization:

+ According to Decree No 02/2002/QH11 dated 5/8/2002 Ministry of Natural Resources and Environment (MoNRE) was established. The functions and responsibilities of MoNRE is stipulated in the Decree 91/2002/ND-CP in which MoNRE takes some functions on state management on Water Resources from MARD. This transition has been carried out successfully.

+ According to Decree No 86/2003/ND-CP dated 18/07/2003 stipulates the function and obligation of Ministry of Agriculture and Rural Development (MARD), in Article 8, item 2 of this Decree, the function of Water Resource clearly stated that MARD takes responsibility for:

- Unify the management over construction, exploitation, utilization and protection of hydraulic and rural water supply works;

- Unify the management of river basins, exploitation, utilization and general development of rivers in accordance with approved plans;

- Unify the management over construction and protection of dikes and flood prevention works and over activities on prevention and avoidance of floods, droughts, erosion of river sides and sea edges;

+ In decision No 93/2003/QD-BNN dated 04/09/2003, Minister of MARD has assigned the responsibility of carrying out the functions mentioned above of Ministry for Department of Water Resources (DoWARE) under MARD. Therefore, it is clear that the operation and activities of the River Basin Organization is under the responsibilities of MARD.

**2. Other concerned legal documents supporting RBO activities.**

Since the Law comes into effect, some bylaw documents regarding to water resources management and river basin planning have been issued such as:

- Decree of the Government on defining the implementation of the Water Resources Law (No. 179/199/ND-CP) signed by the Prime Minister on 30 December 1999 and came into effective from 15 January 2000.
- Ordinance on exploitation and protection of the hydraulic works (No. 32/2002/PL-UBTVQH10) passed by the Standing Committee of National Assembly on 4 April 2001 and came into effective from 1 July 2001.
- Ordinance on Dyke Management (No. 26/2000/PL-UBTVQH10) passed by the Standing Committee of National Assembly on 24 August 2000 and came into effective from 1 January 2001.
- Decision No. 67/2000/QD/TTg of the Prime Minister on the establishment of the National Water Resources Council signed on 15 June 2000.

- Decision No. 99/2001/QD/TTg by the Prime Minister on the Regulation on organization and operation of the National Water Resources Council signed on 28 June 2001.
- Decision No. 37/2001/QD/BNN-TCCB by the Minister of Ministry of Agriculture & Rural Development (MARD) on establishment of Cuu Long River Basin Planning Management Board signed on 9 April 2001.
- Decision No. 38/2001/QD/BNN-TCCB by the Minister of Ministry of Agriculture & Rural Development (MARD) on establishment of the Red – Thai Binh River Basin Planning Management Board signed on 9 April 2001.
- Regulation on groundwater resources exploitation and exploration and drilling licensing.
- Decree on the guideline of implementation of the hydraulic works exploitation & protection ordinance.

And some other legal documents are under development:

- Decree on administrative sanction in water resources field.
- Decree on water pricing and water fee.
- Regulation on water resources utilization licensing (surface water) and wastewater discharge licensing.
- Working Regulation on organization and operation of RBO in Vietnam.

## 3. Orientation for Activities of RBOs:

### *3.1. The tasks of RBO*.

To serve the purpose of integrated water resource management, in the coming time, each RBO will conduct its assigned task as followings:

- Develop river basin plans, submit for approval and monitor the implementation; ensure the coordination between integrated planning management and local administration;

- Coordinate related agencies, Ministries, sectors and provinces in basic investigation; water resources inventory and assessment; development, submission for approval and monitoring the implementation of plans for sub-basins under its River System.
- Recommend solutions for disputes over water resources in its River basin.
- Coordinate with other relevant agencies to investigate and make recommendations and international cooperation (if necessary) in management, exploitation of water resources and other relating resources its Basin.

*Otherwise, to enforce its function as mentioned above, RBOs should undertake the following specific tasks:*

- Assess planning alternatives, basic survey projects, inventory reports and assessments of water resources in the river basin; submit to the MARD and authorized state agencies follow-up recommendations and proposals;
- Review outcomes of planning activities and make proposals to complete and/or supplement to planning schemes on integrated water use, irrigation, flood control and water protection within the river basin;
- Work in collaboration with relevant agencies in implementation and supervision of implementation of planning projects that are approved by authorized state agencies;
- Collaborate with relevant agencies to develop a data and information management mechanism to support water management, exploitation, utilization and protection activities within the river basin;
- Develop and recommend programs on capacity building and awareness raising for organizations and individuals in the river basin in terms of water management, exploitation, utilization and protection;
- Submit to the Minister of MARD and related ministries and state agencies review reports on status of water resources exploitation, use and protection within the river basin;

A General Office with its operational regulation has been established. The Office is provided with qualified staffs to co-ordinate RBOs offices under MARD and other RBO under province. This Office takes the responsibility to assist the Director of the Water Resources Department in carrying out duties and management of PMB Office, including:

- Synthesize recommendations on water related disputes in the river basin,
- Regularly supervise and synthesize the performance of planning and management activities in the river basin,
- To be responsible for collaboration and coordination with international organizations in implementation of planning of river basin;
- Work in collaboration with PMB Office in preparing contents, agendas for meetings, workshops and conferences of the RBO as well as make periodical reports (quarter, annual) required by the Chief of RBO.
- Collaborate with relevant units and agencies in making plans and annual budget estimation for operation of sub-RBOs

### *3.2. Procedures to approve water resource planning*

Since the Law issued, many water resources planning projects have been carried out in given river basins in which the approaches of integrated exploitation planning and environment protection of river basins have been applied. The proposed hydraulic works in the project have to serve for multi-purpose and multi-sector proposals.

Water resources planning projects has been completing and submitting for approval.

Three River Basin Organization such as Hong-Thai Binh, Dong Nai, Cuu Long river have been established for three years under three decisions No 37, 38, 39 of the Minister of MARD but these organization's operation is beginning. With the assistance of Asian Development Bank (ADB), AusAiD, these RBOs have been provided office and its staff, identified the priorities in each aspect, established the

working group and organized workshops to raise awareness and skill in term of management for RBO office staff.

The budget provided by Vietnam Government for RBO office have been used for providing equipment for RBO office, collecting and updating data and information relating to river basin, organizing annual RBO meetings.

**4. Obstacles.**

- The operation regulation of RBO is not issued yet, but the final draft have been summited to the MARD Minister.

- The limited in the river basin management and also coordination between central and provincial level. In the future, capacity building should be required.

- Otherwise, constraint in the fund for the operation of the RBO. We hope that international will pay more attention to finance activities of RBO in Vietnam.

**5. Recent activities**.

Recently, with interest and the support of donors, especially ADB, and the effort of MARD, RBO of Vietnam has achieved the followings outputs:

+ A draft regulation on organization and operation of RBO has been prepared and submitted for approval by Minister of MARD in which the following tasks are clearly mentioned above.

+ Proposing MARD and related ministries to increase the budget for RBO activities to ensure the operation of RBO when the assistance from ADB and AusAID is finished.

+ Requesting international agencies such as UNDP, ADB, WB and other donors keep assisting the operation of RBO in term of:

- Capacity Building for RBO and RBO office;
- Assisting the operation of RBO at least one year since the project finished;
- Providing a forum for coordination between Vietnam and other countries to manage river basins in Vietnam.

## IV. CONCLUSION

Water resource of Vietnam is limited and mostly originated outside the country border. Due to the changes of nature and negative impacts of poor management economic activities, a decline trend in water sources seems to be appeared both in quantity and quality. Water demand for socio-economic sectors has increased days by days. In order to develop socio-economic sectors in effective manner in the coming time, it is necessary to implement water development and management strategy through river basin management is very efficient, it can ensure the sustainable development not only for water sector but also for other social-economic sector However, for the coming decades, population of the country will more increase, the economy will step into a new development phase in direction of crop diversification, pushing up the industrialization, modernization, water demands for all economic sectors will be significantly much higher. In this context, development of a plan for RBO's activities to serve the multi-purposes of water resources development plays important significance to the development of the water sector and other sectors of the country.

I hereby take this opportunity to regard our sincerely thanks to the Organizing committee and ADB for giving us the chance to present our activities to all of you.

Thank you very much!