MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT (MARD)

**DIRECTORATE OF WATER RESOURCE (DWR)**

# THE SCHEME
# for
# IMPROVING THE UTILISATION OF HYDRAULIC WORKS IN VIETNAM

# CONTENTS

# I. OVERVIEW

## 1. The current state of Vietnam's hydraulic work systems

Recently, there are many different types of hydraulic works systems in Vietnam (at small, medium and large scale). In which, there are 904 medium-to large scale systems which can serve areas of 200 ha and above:

# I. OVERVIEW

## 1. The current state of national hydraulic work systems (continued)

- About 6.831 reservoirs with total volume of 50 billion m3.
- 10,076 dams, 10,782 temporary structures.
- 13,347 pumping stations, with the total irrigation capacity of 250 Mw and drainage capacity of 300Mw. More than 5,500 drainage/irrigation sluices (among these: 4000 dike sluices).
- The dike system: 6151.6 km of river dikes, 2488.1 km sea dikes, 25,869 km of flood prevention fences during summer/fall cropping season in Mekong river's delta and hundreds km of rivetment.
- The canal system: 254,815 km of different canals.

# I. OVERVIEW

## 2. Hydraulic work management Organisations

***a. Structure and human resources of Vietnam water management orgs.:***

* VN Government's water resource management:

Until now, there are 62/63 provinces and cities under central government that have established their separate water resource management department , only 1 province (Đồng Nai) which has the water resources division still operating under its Department of Agriculture and Rural development .

Acccording to reports from all provincial water resources departments, the total number of staff working in these org. is 1,831 people . About the capacity of these staff: 64,9% of them have bachelor and master degrees, 18,2% of them have college and vocational training degrees; the rest are primarily qualified staff and assistants for the department (clerks, drivers).

# I. OVERVIEW

* Operating and managing hydraulic works

There are 105 hydraulic work management organizations nationwide under 49 provinces and cities.

The total number of staff in these organisations is about 23,900 people. In which, 15,53% of them have bachelor and master degrees.

# I. OVERVIEW

* Water user associations (WUAs)

Along with state-owned agencies, currently there are water user associations taking part in managing in-field irrigation structures. According to the synthesized data, there are about 15000 WUAs including different types:

- Agricultural co-ops providing general or specialist services;
- Irrigation management units, waterline teams, irrigation teams;
- water user co-ops or water-user associations;
- Communal People's Committees directly involved.
- Some small hydraulic structures are managed directly by the local people.

# I. OVERVIEW

2. Hydraulic work management Organisations (continued)

- b. Policy mechanisms:
- Many policy mechanisms for managing and utilising hydraulic works have been developed, creating the legal basis for the functions of different hydraulic works management organisations.
- - Ordinance on exploitation and protection of hydraulic works no 32/2001/PL-UBTVQH10 on 4/4/2001 made by the Standing Committee of National Assembly.

- Government's Decree 143/2003/NĐ-CP on 28/11/2003 and decree 115/2008/NĐ-CP on 14/11/2008 to revise and amend some articles of Decree no.143 which details implementation regulations for the Ordinance on on exploitation and protection of hydraulic works.

- - Government's Decree no. 140/2005/NĐ-CP on 11/11/2005 to provide regulations on sanctions in hydraulic work utilisation and management.

- Government's Decree no. 72/2007/NĐ-CP on 7/5/2007 on dam safety management .

# II. Significant achievements from 2006 - 2012

**1. The system of state management organisation has been formed throughout from central to local levels to perform the state's water resource management roles .**

During the 2006-2012 period, 11 state's water resource departments had been established, making the number of provinces/citites having water resource departments to be 62/63, only 01 province without water resource department (Đồng Nai).

In the Mekong river's delta region, Bến Tre province is the last one to establish its Water resource department and currently completing its organisational structure to start its operations

**2. The legal system for hydraulic works management have been formed quite tightly.**

Up to now, the legal system for mananaging hydraulic works basically have been established , the highest of which is the Ordinance on exploitation and protection of hydraulic works that is the foundation and provide direction for all other related legal documents.

# II. Significant achievements from 2006 - 2012

**3. The apparatus for managing and utilisation of most hydraulic works have been formed**

The system of hydraulic work management enterprises and WUAs have formed a self-contained apparatus for the operation and utilisation of hydraulic works.

- Hydraulic work management enterprises : they are responsible to manage major structures, main canals which have important contribution in serving productions especially agricultural productions and multi-purpose utilisation.

- Water user associations: are responsible to manage small structures lead to the field or play as a bridge btw companies and the local communities in irrigation/drainage service activities .

# II. Significant achievements from 2006 - 2012

**4. The management and utilisation of hydraulic works in many places have been improved and contributing to serve agricultural productions and social welfare**

In many localities, the hydraulic works management, including state management and operation management is quite stable and funtions well such as Red river's delta provinces and some other provinces like Thái Nguyên, Thanh Hóa, Bình Định, Gia Lai, Ninh Thuận, Bình Thuận, Tây Ninh, Tp. Hồ Chí Minh, and Tiền Giang.

**5. Advanced science and technologies have been initially applied in the management and operation of hydraulic works. Some scientific irrigation/drainage models for high economic valued crops have been implemented**

The application of science and technology in the management and operation of hydraulic works have been implemented during this period through several pilot projects.

Some places have applied technology in management like Đông Anh, Tiền Giang, or agencies under ADB3, WB3…

# II. Significant achievements from 2006 - 2012

**6. Increasing community awareness through the dissemination of laws and Participatory Irrigation management models (PIM)**

Participatory Irrigation management models have been increasingly applied in many different locations nation-wide, especially in grant projects by ADB and WB, serving as an important condition for implemention of these project .

# III. Main Issues

**1. The designed capacity of hydraulic works has not been effieciently promoted.**

While many hydraulic work system can reach higher capacity than its orginal designed one like Cốc Mountain system (Thái Nguyên province), Sông Quao, Cà Giây (Bình Thuận province), some systems still fails to reach their designed capacity such as Kẻ Gỗ, Thạch Nham, Dầu Tiếng...

In Mekong river's delta, some major structures, saline prevention barrage, main canals have been constructed, however there is still a lack of regulatory works, the infield system is still incomplete and the management is not yet efficient.

The number of areas which have active irrigation/drainage is still very small.

# III. MAIN ISSUES

**2. The water resource quality in hydraulic works system is still problematic, even seriously polluted in some places**

The prolem of water pollution caused by waste water and uncontrolled discharge of waste into the canal system,especially in water transfer canal system is very common. In Song Nhue Irrigtion system, the water quality monitoring results show that the upstream part of Nhue River can have acceptable water quality for household usage after having treatment for dirts and Coliform .

In Mekong river's delta the fact that all wastewater from urban , industrial, residential areas, agricultural and aquacultural waste is discharged into rivers and the canal system and the increasing waterway traffic density have resulted in increasing pollution

# III. MAIN ISSUES

**3. The violations of hydraulic work protection boundaries are still common, the punishment measures in current regulations are not effective.**

Violations of hydraulic work safety boundaries take place in most hydraulic works system in Vietnam, only with the exception of recently constructed works .

The protection of hydraulic works by using administrative boundaries is still insufficient, and not connected the local authority's responsibility over hydraulic works protection. Not many provinces have regulations on coordination btw specialized water resource management units and local authorities for their activities.

# III. MAIN ISSUES

## 5. Wasteful water usage and high power consumption

The percentage of areas with gravity-irrigation/drainage is quite small. The water use coeffcients of hydraulic work systems are low, resulting in wasting water . Rice paddies irrigation method of all current hydraulic works system is flood irrigation. A large area of paddy fields still lacks of a completed infield irrigation system .

In agricultural irrigation/drainage, especially Mekong river's delta still uses a lot of fuel oil, despite of water resource abundance the irrigation/drainage cost is still high and water usage is not efficient .

# IV. CAUSES OF THE REMAINING ISSUES

## 1.Objective reasons

a) The increasingly negative trend in weather and meteorological condition, and more severe natural disasters taking place result in the destruction of many hydraulic systems and changes in irrigation requirements of hydraulic works.

b) Socio-economic developments have made hydraulic works system compromised, irrigation area have been invaded, the purposes of those systems also have been altered and losing control. At the same time, socio-economic development is also a main cause of environment and water pollutions in hydraulic works systems.

c) The hydraulic works have to serve small production, fragmented fields and diverse types of crops so it is very difficult to meet the irrigation/drainage, water supply requirements of every crop.

d) Initial investments are still problematic.

# IV. CAUSES OF THE REMAINING ISSUES

## 2. Subjective causes

***a) Awareness***

- In many places people even water management staff still fails to correctly understand about the importance of water resource work. They mainly care about constructing hydraulic works but don't care about management for those works, and also heavily rely on subsidies, disregard participation of the people, leading to the dependence-on-the-state attitude of hydraulic work management organisations as well as people.

- The water saving requirements have not been paid enough attention in the management and utilization of hydraulic works.

# IV. CAUSES OF THE REMAINING ISSUES

***b) Policy mechanisms***

- Lack of policies to create incentives for organisations and individuals to save water, to protect and maintain hydraulic works…;

- The policies on handling administrative violations even though have been written not yet implemented because the object is people with very limited understanding about the laws and there is no specialized law enforcement unit for this problem

- The policy system for Water user associations is still incomplete. There is a lack of authority's attention for the promulgation, application and implementation of institutional policies for these associations.

# IV. CAUSES OF THE REMAINING ISSUES

c) ***About the mangmement and organisation structure***

- Not yet establised a specialised inspection system to inspect and punish violations and harmful acts towards the safety of hydraulic works

d) The human resources for ***h***ydraulic works management are sitll very limited in term of skills, unevenly distributed, there is a lack of local officers, many districts don't have a specialised water resource officer ;

# IV. CAUSES OF THE REMAINING ISSUES

đ) Research and technological and scientific advancement tranfer in the management and operation of hydraulic works have still been neglected. Investment for scientific and technological equipments is still very limited, not meeting the requirements. Many operation systems for sluice are still managed manually

e) The database for managing and operating hyraulic works is still very limited.

# V. MAIN SOLUTIONS

## 1. Mangement solutions

### *1.1. Perfecting the institutional and policy systems*

a) Developing a new law on hydraulic works

b) Specify sanctions for organisations and individuals who violate the laws on effective hydraulic work management

# VII. MAIN SOLUTIONS

***1.2. Improve and complete the organisation, improve the performance and efficiency of the state's irrigation management bodies***

***1.3. Promote sustainable development and ensure the enclosed and specific management over hydraulic works***

***1.4 For water user associations (WUAs)***

- Establish and reinforce WUAs using models appropriate to the local conditions. Research and recommnend mechanism and policies to support the development of these associations

- Decentralise to WUAs the role of managing, utilising and protecting hydraulic works suitably with the scope and capacity of these WUAs under the guidance of MARD

- Organise training sessions, programs, technical assitance for capacity building in the management and operation of WUAs and introducing the water saving irriigation technology to these WUAs

# VII. MAIN SOLUTIONS

***1.5.Promote communications and international cooperation***

- Promote the role of public communication to raise public awareness about laws and policies related to the protection of hydraulic works.

- Disseminating state's and local policies on managing and utilising hydraulic works through mass media…

- Expanding the scope of international cooperation in institutional policies, water resource and hydraulic works management. Taking advantage of the support from international organisations to tranfer technology and financial resourceh.

- Strengthening regional capacity on modernization, moving forward towards a more demand-driven partnership approach to continuous development of tools and guidelines and related capacity building requirements. Setting FAO Reference centres (in Vietnam, Thailand…) for tools/methods relevant to irrigation modernization and agriculture water governance;

# VII. MAIN SOLUTIONS

## 2. Investment and technical solutions

*2.1. Increase the maintenance budget for hydraulic works, investing in completing the system, promote efficient performance of hydraulic work systems*

- Focus on funding for maintenance, repair and operation of hydraulic works from the subsidied irrigation fee budget. Increase the level of support for irrigation fee cut policy, ensure that the regular maintenance budget is not less than 30% of the budget allocation from the state to each hydraulic works management organisations

- Invest in completing the hydraulic work system, especially for systems that lacks canals, sluices and other canal's regulatory works. The budget for infrastructure construction allocated to MARD increase by 10÷20% per yr on average.

# VII. MAIN SOLUTIONS

*2.2. Continue to implement the canal solidification program*

- Implementing preferential lending program (interest rate of 0%)for different provinces to implement the canal solidification program, especially for mountainous, sandy or water scarce areas .

- The government provide funding for canal solidification in the economically and geographically disadvantaged regions, and in all major canal systems.

- Develop mechanisms and policies to support the canal solidification program accordingly to the existing regulations.

Every year, the government can allocate a credit fund of 2000÷2500 billion VND to lend to different provinces for their canal solidification program .

# VII. MAIN SOLUTIONS

*2.3. Reservoir safety policies*

- Evaluate the outcomes of implementing the reservoir safety program from 2003 up to now, then recommend the Government new approach for the next reservoir program.

- Conduct practical study domestically and internationally to issue guidance or manual/handbook on reservoir/dam safety, in which should pay attention to overflow solution for dam/reservoir accidents to ensure the safety.

Every year, allocate about 700÷1000 billion VND to continue the reservoir/dam safety program

# VII. MAIN SOLUTIONS

## 3. For the management and utilisation of hydraulic works

***a) Redefine the actual effciency and capacity of existing hydraulic work systems.***

- Review and re-evaluate objectives and tasks of these hydraulic works systems. Assessing the efficiency of these system's performance accordingly to the newly defined objectives and tasks.

- Conduct experiemental study to redefine the irrigation ecoefficient, the irrigation/drainage water level for different areas and hydraulic work systems in order to develop appropriate standards for current condition.

# VII. MAIN SOLUTIONS

***b) Standarise the utilisation and operation of hydraulic works***

- Specify the safety regulations for hydraulic works, especially for reservoirs and requirements on the construction and implementation process of hydraulic works' Yêu cầu đối với việc xây dựng và thực hiện các quy trình vận hành công trình thuỷ lợi.

- Finalise the system of technical and economic benchmarkings for hydraulic work management organisatios and apply contracting mechanism in the management and operation. MARD can issue some essential technical and economic benchmarkings for mananing hydraulic works i.

- Improve the budget for hydraulic work maintenance to prevent the degrading of these works, have to save an appropriate amount of the irrigation fee reduction budget to spend on operation and maintenance activities .

***c) Promte application of science and technology advancements in the management , operation of hydraulic systems; and in the acceptance and payment of irrigation/drainage services***

- Develop management and operation models applying advanced science and technology, computer science in different regions of Vietnam.

- Deploy installation, completing the regulatory structures for water transfer channel to control the water's flow volume, to manage tightly the volume of irrigation water and to be able to measure the water by volume . Then can pilot sell water or provide water service in $m^3$.

- Some places having suitable conditions to use advanced equipments measure irrigation water for ensuring high quality irrigation service, can be experimented to build pipeline irrigation system to save land, water andreduce the operation and maintenance costs.

- Implement water saving models in suitable systems. Improve the management and operation activities in order to reduce the water loss from the canal and to decrease the amount of irrigation water per ha.

- Step by step to electrify and automatize in management and operation of hydraulic works, firstly for the sluicegate closing/opening system in tidal areas.

# VII. MAIN SOLUTIONS

***d) Participatory Irrigation Management (PIM)***

- Conduct research to promulgate policies encouraging people's participation in managing and utilising hydraulic works; continue to reinforce Water user associations having people involved.

- Promote the role of the people to meet the water using requirements: to effectively serve production, reduce management costs, secure funds for operation and maintenance of hydraulic works, for the hydraulic works to reach their highest performance. Promote pilot model assigned to individual, households to manage and utilise hydraulic works.

- Promote the role of public communication in order to improve public awareness about policies and laws related to the protection of hydraulic works.

***đ) Human resource development policies***

- Organise domestic and international study tours on the management and utilisation of hydraulic works using both domestic and foreign funds

- Implement training, retraining or capacity building programs for organisations and individuals responsible for managing hydraulic works

## 1. Ministry of agriculture and rural development :

- To be in charge, and coordinate with other related ministries and agencies effectively, develop plans and guidances for the local authorities to implement this scheme properly;

- To direct the surveys and evaluation on the current situation and review the objectives and tasks of hydraulic work systems;

- To develop technical benchmarkings,operation and management procedures, economic-technical standards; and to supervise and monitor the implementation at local level.

## 2. Ministry of Investment and Planning:

- To be in charge, and coordinate with Ministry of Finance and other relevant agencies to aggregate demands and balance investment plans for water resource development;
- To be in charge of developing and submit to the government to ptomulgate policies on investments for water resource development in the direction of modernisation, and systematic synchronisation and completion

### 3. Ministry of Finance

- In charge of developing and promulgating financial mechanisms and policies to implement the scheme's content.

- Coordinate with MARD, Ministry of Investment & Planning and local authorities to balance and allocate funds for the implementation of this scheme

### 4. Other ministries and agencies

According to their functions and duties, take part in fostering innovations, improving the efficiency of irrigation/drainage services in hydraulic work system.

# VIII. IMPLEMENTING ORGANISATIONS

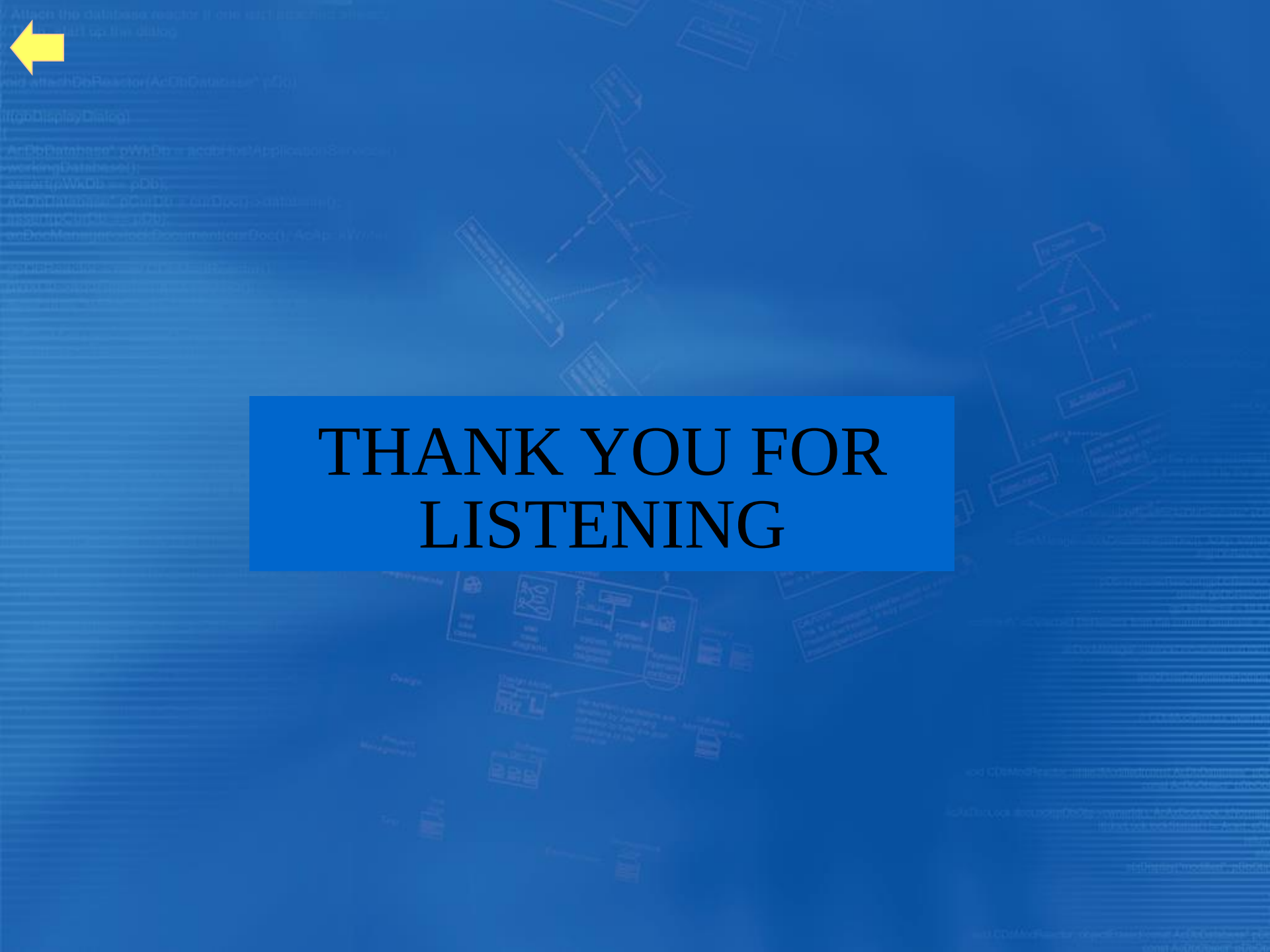
**5. Provinces' and under-central-management Cities' People Committees**

- direct specialised provincial departments to develop the scheme for improving the utilisation of irrigation/drainage, water supply works under local management .

- Organise and implement specific contentts of the scheme, contents relevant to their respective locality .

- Mobilize ressources (local budget, community contributions and other lawful resources) and get people actively invovled in management and utilisation of hydraulic works.

- Report to MARD every 6 months on the implementation outcomes.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