

# GOVERNANCE ISSUE AND CHALLENGES: DEVELOPMENT OF WATER RESOURCES AND IRRIGATION POLICY IN INDONESIA FOR “FARMER’S SURETY”

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## Abstract

This paper discusses the development of governance issues and challenges about water resources and irrigation policy in Indonesia based on the several periods of changes. Issue that affects the development of irrigation can be a social problem, including political or governmental management of economic change over time to time. There are two possibilities that could bring the policy either sustainable or unsustainable ways for both of water and irrigation itself. To be able to be implemented, the policy should be formed into constitution law products, governmental regulation, and all derivatives rules. Once, the situation and the issue about water resources and irrigation rules are ever changing rapidly. In this condition, the main reason from the government are the issues had been, being or will be faced. Unfortunately, those kind policy still unsolved what exactly surety for farmers need is.

### 1. INTRODUCTION

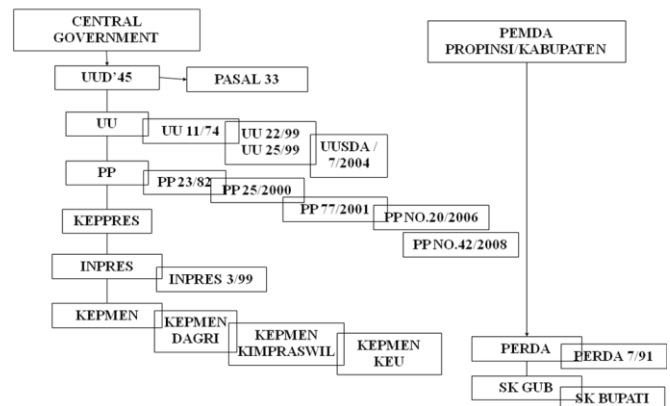
According to mandate UUD 1945, section 33 sentences (3) one declare for that earth, water and contained natural resources at in it gained control by state and used to as big as people prosperity, therefore water resource constituting national potency that shall be brought off one expedient to be able to been utilized as big as it divides people prosperity.

Reviews of the terms set of rules, change in paradigm and political dynamics influence the policy of water resources and irrigation management. Change in the legislation of the Central Government and Local Government. Water resources and irrigation policy changed from time to time include several constitutions, governmental rules such as, i.e.

- Inpres / Presidential Instruction No. 1/1969 on Form of Water User’s Association (P3A);
- UU / Constitution No. 11/1974 on Water Resources;
- PP / Government Regulation no. 23/1982 on Irrigation
- PP / Government Regulation No. 35/1991 on River
- PP / Government Regulation No. 22/1999 on Regional Government;
- Inpres / Presidential Instruction No. 3 / 1999 on Irrigation Management Policy Reform;
- PP / Government Regulation no. 25/2000 on Government Authority and Provincial Government as Autonomous Regions

- PP / Government Regulation no. 77/2001 on Irrigation Management Policy Reform;
- UU / Constitution No. 32/2004 on Regional Government;
- UU / Constitution No. 7 / 2004 on Water Resources;
- PP / Government Regulation no. 6 / 2006 on Irrigation;
- PP / Government Regulation no. 42/2008 on Management of Water Resources.

### LEGISLATION PROCEDURE



Description of a change in the legislation on the show is very influential for the understanding and application of stakeholders and the public. Also not easy to quickly understand and implement these rules, if the effectiveness of socialization, consistency and consequences of the regulations referred to really come.

## 2. PERIOD OF WATER RESOURCES AND IRRIGATION POLICY IN INDONESIA

### a. Period of Pre-Five Years Development Plan (Pra Pelita)

Indigenous jurisdictional basic Dutch colonization inheritance was Algemeene Water Relegment (AWR) 1936. Utilised adjusts to policy situated developing be formed in regulation as spontaneous as President, Presidential Instruction or Minister Regulation and Minister Decision, on a basic that irrigation development was carried on (Soenarno, 2009).

### b. Period 1969-1987

In the late 1970s Indonesia was the world's largest importer of rice. By 1984, it had attained rice self-sufficiency. This remarkable achievement was the result of favorable weather and a concerted effort on the part of the government to develop rice agriculture both on Java, the largest rice-producing area in the country, and elsewhere (Ambler, 1989).

Development of new irrigation in principle centralized "*design as you go*", blue print approaches through rehabilitation, new project irrigation and operation and maintenance. Policy on this period most constraint with local government disability in brought off irrigation already being built. It leaves charges for local government then ignored by asset already being built not functionings as it were (Soenarno, 2009).

### c. Period 1987-1999

This period about policy statement 1987 for Operation and Maintenance (OM) with the principle utilize properly and right what already be had (Soenarno, 2009). Introduction for irrigation water service fee with the aim of instilling the habit of enjoying the pay. The plan was applied simultaneously on all networks, the amount of dues 'flexible', drawn and managed by the Water User Association (WUA)/P3A if succed the number of farmers who pay consistently. But the implementation policy and the result failed because handled by General Revenue Office (Dipenda) not back as it function.

Forgot one of the attention after rice self-sufficiency, is the need for rice will continue to rise as population growth and consumption. On the other hand, irrigated land conversion for other needs also continue growth and result in reduced production of rice. So that in 1994 Indonesia was suddenly more rice importer,

less exposure of information caused "*surprise situation*". The government hastily find a solution with irrigation improvement program peatlands (peat million hectares) in Central Kalimantan. Expensive lesson learns from these programs was not successful as no consistency in carrying out and implementation of policies that are not based on an appropriate strategy.

### d. Period 1999-2006

Renewal of irrigation management policy (PKPI), with principle democracy, desentralized, transparent and accountability. Role sharing irrigation management between government and the role of WUA (P3A) is greater at its job region. Empowerment of WUA with autonomus principle in form of farming unit and government as fasilitator. Irrigation service fee done by coincides and globally. To achieve sustainable of irrigation conserve water resource continuity and prevents irrigation farm conversion.

In this period a new controversy law and constitution was approved as UU No. 7/2004 about water resources, 18 March 2004 by Legislator and 24 May 2004 by Government (Bappenas, Dirjen Bangda, Depdagri, Dirjen SDA, Dep. Kimpraswil) for the implementation on field. The key principle about irrigation management in Indonesia is WUA'S role in operation and maintenance for water allocation on irrigation network and water source.

### e. Period 2006 – at present

Adoption of UU No. 7 / 2004 on water resources had inspired birth of PP No. 20 In 2006 about Irrigation, the government regulation is necessary to further operate. Therefore developed the idea of role-sharing, can be concluded that if the PP is the distribution pattern of irrigation matters remain in the context of desentralization territorial. Role-sharing of material on which the above conclusions seem particularly visible from the scope of which is made. The scope include: (1) Division of affairs in development and management of irrigation systems between levels of government namely the government, the provincial government and district / city governments. (2) Inter-agency affairs division in the same level of government including WUA in planning activities, implementation of the construction, operation and maintenance, improvement and rehabilitation of irrigation asset management, community empowerment, and financing. (3) Affairs in the development and management of irrigation systems include activities to planning, construction, operation and maintenance, improvement and rehabilitation, preparation of guidelines, institutional capacity building in irrigation management, empowerment

communities and farmers, water user associations, irrigation asset management, and irrigation system.

Division of government authority in irrigation management, central, province and district level. The responsibility of farmers in irrigation management increases tertiary, government can help by independence and requisition ground. There is coordination institution (Irrigation Commission) where the members are represent farmers and stakeholders. This coordination board as function to accomodate all stakeholders interest, program, budgeting and solution problem. Participatory principle in the form of ideas, man, material as it needs and ability through WUA (P3A) not personally.

### 3. THE CONCEPT OF WATER RESOURCES AND IRRIGATION SURETY

Policy towards water resources management and protection is fragmented in several governmental institutions, where coordination still the main problems (Helmi, 1997). Water resource management can't do partially, sectorally and momentary, but has comprehensive, aimed, transparent and extended with involve all the interested elements (*stakeholders*), by approaching time, space, quantity and quality that its exploit can optimal and sustain.

Most of the water used for irrigation, about 85% of the total water usage is for irrigation with relatively low efficiency level around 35% - 45% (Dirjen Pengairan, 1995). Water loss is caused there are many factor amongst, such as unwise in water exploit, leakage on channel and soil type. It can regard water deficit, if its exploit coincides among upstream and downstream part it will triggers conflict.

Careful management of scarce water resources is essential to achieving global food security (Tiwari and Dinar, 2002; World Bank, 2003, Faures *et al.*, 2002; Rosegrant and Cai, 2002). Insufficient attention to proper management of water in the past, especially in irrigated agriculture, implies that the scope for greater efficiency in water use is considerable (Qian and Xu, 1994; Kirpich *et al.*, 1999).

Analysis by the International Food and Policy Research Institute (IFPRI) projects that *raising water prices* could significantly increase water use efficiency in non-agricultural sectors, releasing water for more effective irrigation, and allowing expansion of food production (Rosegrant and Cai, 2002). At the same time, properly implemented economic

incentives have been found to improve water use efficiency in urban water delivery and, importantly, in irrigation (Tiwari and Dinar, 2002).

Irrigators know with certainty the availability of irrigation water and the associated agricultural output they can generate within a cropping season. However, they face uncertainty about future irrigation water supplies and agricultural output (Leiva *et. al*, 2007). The concept of irrigation insurance based on a river flow index as a market-based alternative to managing water supply risk in the irrigation subsector of developing countries. The proposed instrument has two important benefits for irrigated agriculture in developing countries: (1) lessening income shocks during periods of drought, and (2) increasing liquidity to facilitate more transactions in a water market.

The challenges facing locally managed irrigation in water-scarce basins are thus twofold: internal and external. Local irrigation management entities need to focus internally on improving irrigation water management, while at the same time negotiating externally with policy makers, river basin authorities and other water users to protect their water allocation at the basin level (Wester *et.al*, 2004).

Integrated water resources management (IWRM) and organizing it primarily at the river basin level are two of the most common and widely repeated recommendations in the water resources literature of the last decade if not longer (Allee 1988; Galloway 1997; McDonald and Kay 1988; World Bank 1993). Basin management, which was previously assumed to be best undertaken through centralized arrangements, has come to be associated with the concept of decentralization, of managing water resources at the "*lowest appropriate level.*" (International Conference on Water and the Environment 1992; Mody 2001.) Beside that, most irrigated production systems which have developed 'spontaneously' in the region are linked to well developed market systems (Norman, 1996)

Several conceptual arguments have been presented in favor of decentralization in water resources management, and basin-level management in particular, including that the entire array of resources and use patterns in the basin will be taken into account, management decisions will be based on better knowledge of local conditions, and public participation will be greater and broader.

One of the concept is Participatory Water Management (PWM) has requirement, nature and performance in private minor irrigation systems and public-sector major irrigations systems differ substantially (Bari,...). But PWM in large systems has not been successful for reasons like (i) lack of reliability of service delivery, (ii) lack of accountability of agency for failure to deliver services, and (iii) growing reluctance of beneficiaries to pay for services which are not assured.

Issues relating to pricing of irrigation water and cost recovery still remain to be addressed.

Major institutional issues – providing a major role for Water Management Association (WMA) in design, implementation and OM, including management transfer wherever appropriate. This is thought to be a better approach than adding on institutional reforms to a construction project. Users' involvement in design, implementation, and OM is essential for sustainability. It has also been argued that better OM, willingness to pay, and sustainability can be achieved through appropriate institutional structures including operational and financial autonomy, rather than through merely increasing user-charges.

Moreover recent approach of water resources development has been using a program (sector) approach rather than a project approach to increase flexibility to respond to local conditions. Public consultation should take place to incorporate local knowledge and ensure acceptability of proposed designs.

Management of water resources sustainability efforts include activities for the presence of water may be utilized optimally for life. Water resources management paradigm change, include the following:

- The centralized government system to be decentralized;
- The role of government from provider to be empowering (enabler);
- Change the function of the social function of water into the social and economic functions;
- System top-down approach to bottom-up and top-down,
- Organization of transparency, and democracy is rooted in the community

Community is a set or group of people together have interests in common, including in terms of water resource management. Community is the water user, as a user, the community has rights and obligations relating to water. Community has the right to adequate water for daily use; for drinking and other domestic activities. Community is obligated to maintain the existence of water that can be obtained at any time. Maintain the existence of water in the community to participate actively in environmental conservation activities related to water. Some examples include the maintenance of forests and watersheds, maintaining water catchment infrastructure, and allows water to seep into the soil in our yard by not closing the entire with cement.

In community base to develop capacity or efforts to WUA empowerment include:

- WUA capacity of the organization, increased ability of the organization WUA managerial and administrative capabilities and organization that manages steadily owned irrigation.
- Increased technical capacity of irrigation, ability to organize much needed in making a professional institution both in govern themselves and also cooperation/partnership with the outsiders.
- Improvement of farm technology, is one of the main factors in agricultural development, WUA members need to understand technological changes. Optimizing the use of land, increase land productivity plants. Boosting the income of income individuals and WUA. The technology developed should be a technology location-specific nature global and economic high value.
- Improving the ability of economic enterprise, in an effort to create agricultural sustainable in all aspects (technical, land and processing agricultural affairs), i.e:
  - One is the improvement of the ability of farmers / WUA in economically-oriented activities.
  - Improvement of farm to the provision of production facilities farm infrastructure.
  - Application of appropriate technology recommendations local conditions, increased value added and marketing.
  - Increased efforts by facilitating economically performed in order institutions have access to banking / finance and establish partnerships with other affairs entities.
  - Irrigation technical upgrade-members need to have the WUA's ability operation and maintenance through training and guidance in directly to WUA.
  - Experiment (trial on station) and demonstrate;
  - Stimulant production facilities such as fertilizers, seeds / seedlings, pesticides, farm machinery equipment (Alsintan) and working capital;
  - Stimulant farming infrastructure such as farm roads, farm stalls;
  - Stimulant processing and marketing of farming such as processing corn, coconut, cassava, etc.;
  - Facilitation WUA to conduct affairs partnership.

Some steps of the concept about planning *the implementation of operation* of irrigation networks, that could be implemented in different scale and depend on the scope:

- Annual Water Plan was made by technical agencies at the district / provincial level in accordance with his authority, based on the availability of water (dependable flow) and make proposals consider planting planning and plan annual water needs, and hydroclimatology conditions.
- Planning global and detail planning, Federation-WUA/GP3A with all its members held a full meeting

and coordination to discuss the proposed Plant Layout Plan (Rencana Tata Tanam) on each their working area.

- The results of this coordination in forum have to be socialized actualizing F-WUA/GP3A spread further to the WUA and disseminated to members to be implemented.
- Commission Irrigation District / City or Province every year before the planting season held a meeting to discuss and coordinate the proposals from FWUA/GP3A to determine the Annual Plant Plans from each region that includes irrigation planting global and detail plan was proposed to the regent / mayor or governor to be approved.

The steps of the concept about *the implementation of maintenance* of irrigation networks, that could be implemented in different scale and depend on the scope:

- Security of irrigation system as an asset
- Routine maintenance
- Periodic maintenance
- Countermeasures / emergency rehabilitation due to natural disaster or severe damage to the extraordinary events.

### **The Main Frame of Irrigation Development**

The main frame of irrigation development in order to support the achievement of national goals, then the entire set of policies, whether in the form of regulation, institutional development, technological development and human resource development and research needs to consider various strategic changes.

#### **1) The Water Use Rights**

Increased competition of water use (both internal and external sector) as a result of increasing population and development activities in various sectors of development, should be anticipated with a clearer rules about water use rights, so as to clear the protection of the rights of water users, especially for farmers / agricultural sector. The right to water for farmers including the right to obtain incentives for the efficient utilization efforts. In addition farmers can also sell or lease water rights on their own have the group of farmers / groups that require.

#### **2) Water Use Permit Criteria**

Necessary to develop criteria for granting permission to use the water with the aspect of water availability, existing spatial and socio-economic structure.

#### **3) Clearance Coordination Use of Water**

To anticipate the increasing problems of water demand from various sectors, should be ordering the government bureaucracy more effective, particularly to improve coordination between sectors in giving permission to use the water.

#### **4) Quality and Quantity of Buildings for Allocating and Distributing Water**

To improve the effectiveness and efficiency in the allocation of water along the river and the distribution of water in the map, have improved the quantity and quality of the building (technical aspects) of irrigation and the quality of human resources managers.

#### **5) Historical User Rights First**

Need to set the priority of water use, in addition to prevent practices that may deprive the historical part of the first user to meet other interests.

#### **6) Anticipation of Elimination and Environmental Degradation**

Degradation of the physical environment resulted in irrigation water supply crisis, both in terms of quantity and quality, and anticipated needs eliminated since the activities of the irrigation network development planning.

#### **7) Conservation Principles, Capabilities and Customs Farmers in Design Build**

Water is an element of an ecosystem. In the ecosystem in which there is no human intervention significantly run ecosystem equilibrium, in this situation the hydrological cycle in a reasonable way, so that water as an element in sustainable ecosystem inside. Meanwhile, water is vital for human life, therefore water must be utilized for the benefit of mankind, the consequence is the possibility of disruption of ecosystems, and to achieve a new balance in the ecosystem requires a long time. So the central point is how to harness water wisely so as not to be a real disruption to the ecosystem balance.

In developing the irrigation network design, need to consider the principle of conservation, skills and habits of farmers.

#### **8) Irrigation System Management Concept Friendly Environment**

Environmentally irrigation systems need to be implemented in a way: a review of design criteria for the renewable and limited, possible implementation of conjunctive management system.

#### **9) Development of Water Efficient Irrigation Technology**

With the increasing competition and limited water use water resources, it is necessary to develop the technology of water-saving irrigation.

#### **10) Water Use Efficiency**

There are several factors that cause loss of water, this is because:

- 1) a narrow area and conditions of box tertiary cause water loss, because the relative water flux is very small compared with the loss of water in channel network;
- 2) there is a tendency of farmers to hoard the water because there was no certainty of obtaining water from the main network and the assessment that the water service than inadequate utilized.

Of the two it is, problem solving on issues of water use efficiency improvements and water fees should lead to improved water supply services, acceptance of risk of crop failure among providers of water with farmers and the determination of the acquisition values the benefits of paying the water service. One of the main key to solving the problem is the quality standard of acceptable irrigation performance (agreed) by the provider of water and by farmers.

#### **11) Comprehensive Involvement in Water Conservation Efforts**

Public awareness efforts in terms of efficiency of water use need to involve the private sector, because this sector requires more and more water for their operations. Thus, public awareness activities in the utilization of water in an efficient water should be more comprehensive by involving farmers, private entrepreneurs and other beneficiaries. In the sphere of agriculture, irrigation water is coverage of water-saving movement to cultivate the behavior of all walks of life to improve productivity and irrigation water use, allocate it to productive farming targets, ensuring the water needs of a fair and equitable, and to maintain the carrying capacity of water resources in a sustainable.

#### **12) Water Management in River Basin**

River as a source of flowing water is a resource that is not about administrative boundaries, and with features such consequences arise that need to be considered in determining public policy and development management, related to the implementation of regional autonomy.

Three main consequences associated with these problems include:

- Use of water in an administrative area will eliminate the chance of its usefulness in other administrative areas in the downstream, which may give values greater benefit;
- Pollution of water in the upper reaches of the administrative region will provide the social costs in the administration area in the downstream;
- Administrative area is the guardian of the upstream water conservation and water resources, but the main beneficiaries are the lower administrative region.

In carrying out development activities, need to consider linkages between various water users along the river, along the irrigation areas, the linkage between surface water with ground water, and the need to improve the maintenance of catchment areas and develop management systems one river, one integrated management.

#### **13) Operation and Maintenance**

Reviewing the system of O and M that is currently applicable to better guarantee the farmers to obtain information about the availability and acquisition of water, by the way:

- Improved planting patterns and procedures;
- Improved management information systems;
- Transparency in the system of O and M.

#### **14) Spatial**

Conservation and irrigated land convert caused economic losses decreased ability of agricultural production and also loss of irrigation investments. To avoid the double loss of the conversion of irrigated land, so that spatial planning can be realized, especially in the area of expansion of irrigation networks. Spatial plan which was agreed should be accompanied by empowerment of the existing institutions to make it real.

#### **15) Farmer Participation and WUA**

Given the importance of sustainability of the irrigation network functions, the participation of farmers in each phase of the irrigation activities (planning, implementation, evaluation and utilization of results) is essential and needs to be improved. According to the principle of decentralization and regional autonomy, the WUA institutional forms need to be adjusted to local needs (not necessarily uniformity).

#### **16) Development and Institutional Strengthening of WUA**

With a completely more irrigation management, it is necessary to develop an organization capable of

answering WUA's problems of irrigation management (able to finance and implement O and M on the diversification of farming activities). As an institution that can represent the farmers in partnership with institutional and other interests. WUA institutional strengthening including building WUA Federation, to face competition and changes in water resources by placing WUA as representatives of farmers who have voting rights (not only invited) in any decisions relating to the use of water (including expanding the rights, duties, status, function and its role in the Irrigation Commission).

#### **17) Irrigation Infrastructure Services**

Needed infrastructure services that can meet the irrigation and ensure the future of agricultural conditions. To achieve this it needed the support of human resource development and able to manage irrigation more effectively.

#### **18) Anticipate Change Social-Institutional**

Because there is a change of agricultural conditions and social change in society, then it should be anticipated with the socio-institutional design appropriate to the challenges and changes that occur.

The concept of the policies mentioned above, water and water resources locally, which is geographically located in one administrative area of District / City, then in principle by management of District / City Government. Water and water resources that are regional, which is geographically located in two administrative regions of District / City or more but still in one province, then in principle by the management of the provincial government. Water and water resources of a national / international, which is geographically located across Province or State cross, then management is carried out by the Central Government. In addition to records, in order to conduct a broad autonomy, the equivalent cooperation between district / municipal, and inter-province, it is recommended in the framework of water management and water resources together.

### **4. DISCUSSION**

#### **1) Lesson Learn**

Drought in the year 2003, Indonesia was hit by a severe water crisis, especially the island of Java, the potential of freshwater only 4.5% but have to bear 65% of the population Indonesia, current condition is very critical and not sustainable. Every year the island of Java water deficit of about 13 billion cubic meters (Kompas, August 26, 2003). Impact, there 485 villages in Java, which suffered a severe water crisis. As a

result, the government must do saving measures for millions of residents and farmers affected drought, such as free rice aid, reforestation projects, designing agricultural systems that are not require much water as rice to farmers, and open lands of new fields outside of Java.

Related to the availability of water for irrigation purposes, will be more complicated to manage irrigation networks where lack of water which resulted in not functioning properly. Also, the management level is still struggling in policy, stakeholders and other things that increased the complexity of irrigation management.

In case of the implementation of operation and maintenance (OM) irrigation systems that have been built by the government almost totally ignored the participation of the user community. As a result most of the OM activities, including financing done by the government. With limited funds owned, so the longer the government increasingly unable to carry out the financing activities of O M is worth the irrigation system.

To anticipate this government has issued several policies related to community participation in O M, among them the issuance of government edict about O M in 1987 the irrigation system and for the subsequent delivery of the program followed by Small Irrigation (PIK) and the Irrigation Water Service Fee (IPAIR); program Efficient Operation and Maintenance (EOM) and the calculation of the cost of OM based on the Real Needs Numbers Operation and Maintenance (AKNOP) is implemented using a bottom-up approximation.

In the regime of the new order, irrigation development is the main point of irrigation development in Indonesia and aims to break the chains of poverty by increasing agricultural production. To achieve these objectives used three basic strategies, namely:

- Construction of infrastructure;
- Provision of incentives;
- Institutional development including the formulation of laws and regulations and management organization (Afff, 1992).

In accordance with the selected basic strategy is the development of irrigation, including irrigation management and all its assets is more emphasis on: (i) the physical development of rice-based irrigation infrastructure in achievement-oriented goals (target oriented), (ii) engineering approximation is based on technical considerations - economic, (iii) the principle of centralized, and (iv) the principle of uniformity of method of execution by ignoring the local strategic environment methods (Pusposutardjo, 1996; Arif, 2000; Gany and Darismanto, in 1999).

Fidelity and speed of achieving the target of physical development of irrigation infrastructure can be marked by the achievement of the technical development of irrigation networks quickly and achieve self sufficiency in rice in 1984 and the next few years. Moohtar (1992) mentioned that starting from year to year 70's to be opened in 1990 has been a technical irrigated land area of 4.0 million ha. But the implementation of infrastructure development with the technical-economical approximation alone without considering other aspects including human asset management, resources and environment has caused unsustainable development goals have been achieved.

In fact, the Government of Indonesia has great potential to create institutional the more radical in the farming communities and autonomize in stakeholders irrigation because of the character and function of the tiered affair systematic irrigation became one unity as revealed in advance. Instead, the existing rules, it is clear increasingly powerful institutional arrangement informalisme overall irrigation especially tertiary irrigation which was allowed by the Government (Irfan, 2007).

*Why the Government does not immediately suggested that the development of functional decentralization is strong institutional at the local level in the management of water resources for farmers?* So far, the irrigation affairs in the context of using the basic levels of government irrigation areas as a way to distribute these matters from various level of the Government of the territorial point of view alone. Because territorial government consists of the central government, provincial, and district / city even subdistrict and village or the like, the distribution was tiered by relying on the character of these levels of government.

In practice, it is generally difficult to place a symmetric pattern of hydrological character and the character of the composition of the territorial government. However, it can be described that affairs in the field of strategic irrigation owned by the Government. Government remain a part who has final responsibility in the management of this irrigation. For that, always have affairs in this irrigation area developed centralized.

## 2) Strategy for the Next Period

Threatened the availability of water in the watershed have pursued a spatial planning that has been established where the conservation area and cultivation and settlements that maintain the natural balance and that does not harm human life, if no penalty is applied in the form of reward and punishment. The existence of the efforts that have been incentive for conserving water resources and water resources.

In terms of effort building a strong foundation in the management of water resources and irrigation, first with the institutional structure of the foundation at the bottom level of the WUA with the maturity of thinking that are embedded. In implementing this required the supervising personnels who know and understand the circumstances and all the problems. This is also supported in the form of incentive for those involved in the empowerment of institutional.

Participation of farmers in water resource management should be improved, not only on management at farm level, but until the distribution and transport in the top level. WUA Federation based on the spread of hydrology is a strategic step in the effort to provide broader authority in the management of irrigation especially O and M. Through the merger WUA based hydrological stretch followed by the authority, an expanded to support increased efficiency WUA performance. This will be characterized by: (a) lack of bureaucratic elements, (b) communication and coordination is relatively quick and smooth, (c) the stakeholders concerned in the management of the organization represented WUA Federation, and (d) Irrigation service fee management will be more transparent and democratic.

In order for the water management system that can run smoothly and sustainable, it is necessary the independence of the organization, especially at the lower level that most do not include four things: (a) organization and management; (b) financial management; (c) financing O and M; (d) deal with external forces.

## 5. CONCLUSION

- 1) In order to develop of water resources and irrigation can support the achievement of national goals, then the entire set of policies in both the regulatory, institutional development, technology development, human resources and research need to consider various strategic changes.
- 2) Irrigation development goals in addition to achieving self-sufficiency in rice must reach the



broader development of increasing economic growth opportunities, especially for farmers.

- 3) In the law UU No.7 / 2004 on water resources, Article 5, The State guarantees the right of everyone to get water for a minimum basic needs of daily life in order to meet a healthy, clean, and productive. The policy means that the certainty for the farmers legal basis already exists. This is a challenge for the state to fulfill it.
- 4) From 18 of the main frame of the development for irrigation as mentioned before, are the things and the many obstacles encountered in the field, and until now the role of water resources management and irrigation sector is still in one side, despite of the establishment of a coordinating body such as the Water Resources Council (Dewan Sumber Daya Air), Commission on Irrigation in central level, provincial and district/city, as mandated in Law of Water Resources UU No. 7 / 2004 has formed. The effectiveness of performance has not emerged yet and still need more professional staff and reliable both from government, non-governmental and farmers are able to accommodate all the needs that have not been accommodated for e.g the rights to water for each farmer must be clear and respected, if not it will be difficult to make a deal.
- 5) The cycle of policy on water resources management and irrigation has faced from various experiences to this point is very expensive learning process and valuable. This is like a vicious circle that cycling and no way out. The main factor is the absence of the principle of trust among stakeholders of the lowest level to top level or vice versa. Existing diversity can be harmonized with the principle of local wisdom priority, socio-cultural, which is able to solve the water disputes occur rapidly among WUA members.
- 6) Efforts in terms of encouraging an understanding of stakeholders for water saving and environmental protection adjusted to the conditions in each local to national levels. Institutional strengthening needs and can control water availability and the growing sense of belonging to the

irrigation so that maintain the continuity of the function.

## ACKNOWLEDGEMENT

This paper is written is based on the sets of journals, articles, books related to management policies of water resources and irrigation as well as the opinions of experts the field of water resources and irrigation. The writer tried to understand and analyze the various existing studies on the management of water resources and irrigation of the aspects of the legislation, institutional aspects, and socio-economic aspects and other relevant aspects. This paper is far from perfect and still very necessary constructive comments to increase the knowledge and experience in an effort to contribute thoughts about sustainability of water resources and irrigation.

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