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Study of Institutional Evaluation in Drainage System Management of Semarang as Delta City

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Abstract-Semarang City is one of the cities located in deltaareas. Semarang face problems that always floods inundated parts of the city in every year. Flooding is caused by several things including the change in land use, intensity and high rainfall, erosion and sedimentation in the river channel, decreasing the capacity of the river, building damage flood control, and planning control systems are less precise. Efforts to control the flooding has been done, but more important is how big investment can operate and be managed according to plan is to deal with the flooding problem. Therefore, studies are needed to evaluate the management of the drainage system in Semarang city.
The data obtained in this study through the literature and the parties related to the management of drainage in Semarang. Literature study conducted to evaluate institutional managers drainage system Semarang. The aspect covered are institution aspect,regulatory aspects, financing aspects, community participation aspect and technical and operation aspects.
The results showed that depend on institutions aspect, the existing institutional model is still using the drainage system management by the government, where this management model is facing many obstacles, especially in terms of financing. Therefore we need a model institution that can improve community participationactively in the management of drainage sytem of Semarang.

Keywords: evaluation, institutional management, drainage system

1. Introduction

Drainage is the technical term for the act of handling excess water caused by rain, seepage, excess irrigation water, as well as household waste water, by means of drain, drain , discard , absorb , as well as other businesses , with the ultimate goal to restore or improve function region. In general, the drainage system is a series of waterworks which serves to reduce or remove excess water from an area (Tanudjaja, 2008).

Drainage can also be interpreted as an attempt to control the quality of groundwater in relation to salinity. Functionally, difficult to separate clearly between drainage and flood control systems. Puddle incurred in connection with the flow in the drainage channel due to local rain hampered get into the trunk or to the river, often also referred to flooding. Distinguishing inundation due to the overflow of the river with local rain puddles due to substandard flowing into the river, often have difficulty (Tanudjaja, 2008).

The problem of flooding in Semarang city, not a simple matter. Many factors affect and require careful consideration in the planning, among others, an increase in discharge, narrowing and silting of channels, reclamation, land subsidence, liquid and solid waste (garbage), and the tide. Land subsidence is the case in the city of Semarang resulting floodwaters worse. Land subsidence is caused mainly by excessive groundwater abstraction, which resulted in some parts of the city are the same height and even below sea level pairs. This resulted in gravity drainage system will be disrupted, not even able work without a

pump. Even in some places can cause permanent inundation of the tide that is commonly known as tidal flooding (Wahyudi & Adi, 2012).

In 2006, the Government of Indonesia has obtained a loan from the Government of Japan through JICA-IP 534 Loan to finance flood control, drainage area of settlement and development of water resources in the city of Semarang. This program requires a huge investment costs, but more important is how big investment can operate according to plan is to deal with tidal flooding problems in most of the central area of Semarang and sustainability. Therefore, the necessary studies on the evaluation of the management of Semarang drainage system. The aspects covered in the institutional management of drainage system includes organizational aspects, legal aspects, financial aspects and aspects of community participation / social.

2. Fundamental Theory

2.1 Drainage Problems

The main cause drainage problems are increasing population. Urbanization taking place in almost all major cities in Indonesia has increased the burden becomes heavier urban areas. The increase of population is always followed by an increase in urban infrastructure such as housing, transportation, clean water, education infrastructure, and others. In addition, the increase in population is always followed by an increase in waste, both liquid and solid waste (garbage). The need for land for settlement and economic activity will increase resulting in a change in land use resulting in an increase in surface runoff and flood peak discharge. The amount of surface runoff is determined by the pattern of land use, which is expressed in a flow coefficient that varies between 0.10 (flat forest) to 0.95 (pavement). This shows that the transfer function of forest land into the pavement could increase flood peak discharge up to 9.5 times, and this has resulted in the existing drainage infrastructure be unable to accommodate the increased discharge (Tanudjaya, 2008).

Poor waste management contribute to the acceleration of the silting / narrowing of the canal and the river, so the ability to drain the water from rivers and drainage channels to be reduced. The land use change from forest (open area) into the region woke up (trading area, settlements, roads, etc.) also lead to increased erosion. Materials eroded, carried along into the river channel and thus contributed to the silting and narrowing.

Therefore, any development of the city should be followed by evaluation and improvement of the system as a whole, not only on the location of the development, but also around the affected area. For example, the development of a residential area in the upper reaches of the drainage system, the drainage planning is not only done in the settlement area, but the downstream drainage system should also be evaluated or redesigned if necessary. If this is not done, then the developers involved should be able to ensure that water from developed areas did not change from before and after development. Another way that can be taken is the developer must provide an artificial recharge in the development area.

2.2 Drainage Management Aspects

The purpose of all the steps in the management of drainage is the creation of a condition that is ideal drainage management implementation, synergistic, integrated and harmonious. Which is expected to create synergy in the context of regions, sectors and generations, that's the essence of which is contained in the management of drainage,

including drainage system applied in the management of Semarang. An understanding of these goals, both philosophically and empirically to be able to animate every step of every organization's activities, groups and individuals who are included in the stakeholder groups. If these prerequisites are met, then surely all hang expectations will be achieved more effectively and efficiently.

Understanding of the purpose of drainage management should also be linked to an understanding of the functions and principles of drainage management. Water resources management function consists of at least three things, namely a social function, the function of environmental and economic functions. All three of these functions should be pursued in synergy implementation anyway, so as to bring the maximum benefit for all parties.

Institutional formation drainage systems are generally based on aspects of drainage management (institutional, regulatory, financing, community participation, technical and operational). The relationship between aspects can be described as in Figure 1 below:

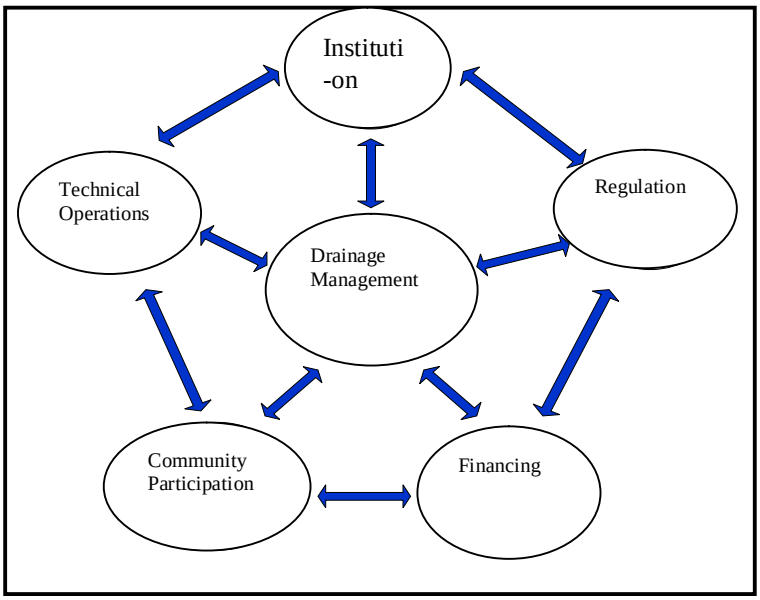

Figure 1. Drainage Management Aspects
Source : Puslitbang Sebramas – Ministry of Public Work, 2010

2.3 Institutional Development

Institutional development is a perspective of social change planned and nurtured. Development agencies regarding innovations which implies a qualitative change in the norms, the patterns of behavior, the relationships of individual and group relations, the new perception of the goals and methods. Institution building is not associated with repeated patterns that already exist, with marginal deviations from the practices of the past, or with slight improvements in efficiency alone. The main theme of which is dominant in institutional development is innovation.

The objective is to build institutional development organizations viable and effective build support-support-completeness and comprehensiveness in its environment. Development agencies can be defined as the planning, structuring, and the guidance of new

organizations or rearranged that (a) realize the changes in values, functions, technologies, physical, and / or social, (b) establish, develop, and protect normative relationships and patterns of new actions, and (c) the support and completeness in the environment. Concepts that became the model is summarized in Figure 2.

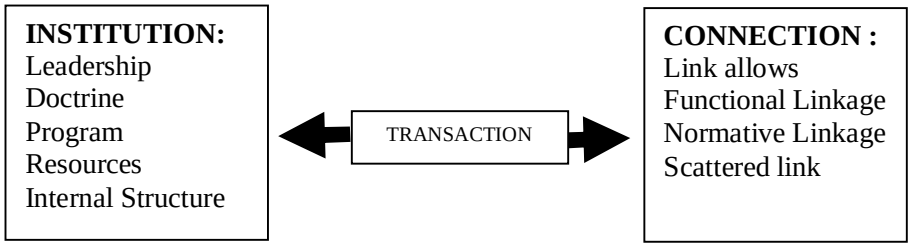

Figure 2. Institutional Development Model
Source : Milton J. Esman, 1986 in Indrawijaya, 1989

Based on the model, it can be institutional development efforts in various fields, including the institutional management of water resources in Semarang drainage management system.

3. Research Methodology

In order to get a good work, then an appropriate implementation strategy and integrated indispensable. The stages in the preparation of this study are as follow :

1. Describe the management of the drainage system in the city of Semarang today
2. Analyze the institutional problems in the management of the drainage system of Semarang
3. Providing solutions to address the institutional problems in the management of the Semarang drainage system.

The data in this study are obtained through interviews with related parties as well as the study of literature from various sources.

4. Result and Discussion

4.1 Existing Overview of Semarang Drainage System

Handling the problem of flooding is not enough simply done by building physical infrastructure such as pumping stations, retention ponds and dike. Operations and maintenance are both very important to ensure the functioning of the physical infrastructure that is built in the long term. Unfortunately, operational tasks and maintenance of flood protection infrastructure has been less than optimal due to the limited treatment remains piecemeal. As a result of not optimal handling encountered many areas still affected by the flood, such as in the area around the Semarang river, Kali Baru and Kali Asin.

Based on the management aspects of drainage, drainage systems management overview of Semarang are as follow :

1. Institution Aspect

   Drainage management in Semarang is still managed by the Department (bureaucrats), the Department of Water Resources and Energy and Mineral Resources (NRM-EMR). Special handling is the head of the field drainage water system is assisted by the head

of the drainage section, section head of operations and maintenance of the water system and section chief infrastructure and water management and assisted by several heads of Regional Technical Implementation Unit (UPTD).

2. Regulation Aspect
   The legality of the management organization is the Decree of the Mayor.
3. Financing Aspect
   Financing drainage management Semarang funded for one year about 40 billion but the actual use is only about 15% only. The financing of the budget revenue only from Semarang city.
4. Community Participation Aspect
   During this community participation is still lacking an active role in the management of drainage. This is because the characteristics of the people who still littering in the river so that eventually lead to clogged drain or noncurrent.
5. Technical Operation Aspect
   Technical operations based on the division of sub-drainage system in the city, for the sub-system drainage Middle Semarang handled by the Department of Water Resources and Energy and Mineral Resources (NRM - EMR) Semarang. As for the technical operations in the field are the responsibility of the Regional Technical Implementation Unit Office of Water Resources and Energy and Mineral Resources (UPTD NRM & EMR) Northern Territory. UPTD NRM & EMR Northern Territory's handling sub-system drainage of North Semarang and Central Semarang. Technical operations to Central Semarang system that includes operational technical Bulu Sub System, Tanah Mas Sub Systems, Kali Asin Sub System, West Bandarharjo Sub System, East Bandarharjo Sub System, Old City Sub-System, North Banger System Sub, South Banger Sub Systems, Sub system and Tugu Muda Simpang Lima Subsystem. Operation and maintenance which should be addressed is the pumping system, retaining walls, drainage, retarding pond and river flow

4.2 Analysis of Problems and Solutions in Drainage Management of Semarang

Drainage management in Semarang showed less than optimal results, it can be seen from the number of flooded areas. The following are the results of the analysis of drainage management issues in Semarang terms of five aspects : institution aspect, regulatory aspect, financial aspect, community aspect and technical operations aspect.

1. Institution Aspect
   Drainage problems in the city of Semarang, expecially in Central Semarang sub system from the aspect of the institution is not very optimal if drainage management is handled by the number or quantity of service personnel were very inadequate. And also of the quality of the personnel who specialize in the management of the water system in the city, still less competent seen by looking at the degree that most of the new education equivalent undergraduate degree in which the understanding of science, especially inundated field is still common. For it would be competent if the personnel who handle these issues are already educated master degree with a special concentration fields inundated. Plus personnel placement pattern in which the bureaucrats will occur periodically rooling or mutation is also a problem in itself, because the replacement personnel must adapt that must take time and a different level of understanding.

2. Regulation Aspect
   From the aspect of regulation, drainage management in Semarang was referring of regulations and decrees mayor. By looking at the current dynamics plus drainage management issues are increasingly complex, with an operational basis for regulatory level mayor and the mayor's decree less strong binding primarily of legal and political aspects. Because the obligation is still in the hands of drainage management services (public and private not involved), and a model of reward and punishment not been applied. Therefore, in the management of drainage, institution or agency should be no strong legal regulations (local laws).
3. Financing Aspect
   Common problems in handling a development activity is the cost or budget constraints. Likewise, in the handling of drainage management in the city, budget constraints are also an issue. Budgetary resources from the Semarang own budget and or the state budget are not enough to deal with drainage problems from the aspect of financing. For that according to the analysis of the financing aspects of drainage management is not only coming from the government, the concept needs to be applied so that the drainage fee obligation in financing not only from government funds, but also private and public funds can be entered, and in the management of the budget is the responsibility of society and government.
4. Community Participation Aspect
   Community participation has a vital significance in the success of development. Likewise, in the management of drainage in the city, community involvement directly from start to finish is very necessary and important. By looking at the current state, drainage management is handled by the government, both at the planning, implementation, operation and maintenance, as well as a good evaluation of the network of primary, secondary and tertiary full responsibility still lies with the government showed less optimal results. For that direct community involvement in the management of all phases of drainage is important to apply. So that the community has the responsibility and awareness of the importance of managing the drainage system is good and right that can be perceived usefulness.
5. Technical Operation Aspect
   Drainage management in the study area is still under refinement. Kali Asin, Kali Baru, and Kali Semarang as primary drainage network, until now complement building is still in the implementation of development.

6. Conclusion

Based on the study of aspects of management consisting of aspects of the organization, legal aspects, financing aspects, and aspects of public participation, it can be concluded that the current institutional framework for the management of drainage in the city of Semarang still face many problems. The main problems are still used drainage systems management based on management by the government. Drainage system management by the government, often face financial constraints, especially in the operation and maintenance of drainage systems. Therefore we need a model institution in the management of drainage system capable of dealing with these problems by further increasing community participation.

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