

PROCEEDINGS

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Semarang, February 20th 2015



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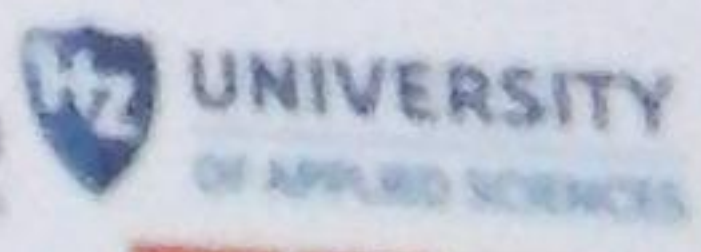
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PROCEEDINGS

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ISSUES, MANAGEMENT AND ENGINEERING
In The Sustainable Development *on Delta Areas*



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PREFACE

The coastal area or delta area is an area with huge potential to be developed. Development of delta areas as a city has a very strategic value because the city can be developed as a port city, recreation and conservation. However, in its development, many problems arise in urban development efforts in this coastal region. These problems include the pollution, over-exploitation of natural resources, abrasion, habitat degradation, conversion of the designation of protected areas into other development, and natural disasters. One of the most dominant constraints encountered in the development of delta areas is a flood.

Flooding problems in the delta area, not a simple matter. Many factors influence and required 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 that occurs in many coastal cities resulting floodwaters. 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. As a result of gravity drainage system will be disrupted, even cannot work without the help of a pump. Even in some places can cause permanent inundation of the tide that is commonly known as tidal flooding.

The problems in coastal areas need to be resolved. This is due to the dependence of communities on coastal and marine resources. Where the function of coastal and marine areas is a port (transport), recreational and conservation areas.

With regard to the existence of these problems, the Universities play an important role in contributing ideas to give feedback suggestions and solutions. Therefore, Faculty of Engineering, Universitas Islam Sultan Agung (UNISSULA), held the International Conference with the theme "Issues, Management and Design in the Sustainable Development on Delta Areas".

Participants of the conference included researchers, academic staffs, students, industries, governments. The keynote speakers and invited speakers during the conference are as follows :

Keynote speakers :

- **Dr. Ir. Arie Setiadi Moerwanto M.Sc.**

Director of Empowerment of Water Resources, Minister of Public Works and Public Housing, Indonesia

- **Bert Hooijer**

Director of RDM Centre of Expertise, Rotterdam University of Applied Sciences, Netherlands

Invited speakers :

- **Rick Heikoop., MA., MEMR**

Senior Lecturer/Researcher Water Management, Rotterdam University of Applied Sciences, Netherlands

- **Ir. Steven Starman**

Manager International Project, Van Hall Larenstein University of Applied Sciences, Netherlands

- **Arthur Hogduin., M.Sc**

Director Education Delta Academy, HZ University of Applied Sciences, Netherlands

- **Frits Blessing**

Program Manager Living Lab Logistic Indonesia-Netherlands (LLLI – NL)

- **Ferdian Suprata**

Program Coordinator Living Lab Indonesia, Nufic Nesso Indonesia

Proceedings **INTERNATIONAL CONFERENCE ON ISSUES, MANAGEMENT AND ENGINEERING IN THE SUSTAINABLE DEVELOPMENT ON DELTA AREAS** is a collection of papers are arranged to follow this International Conference. The papers are subdivided into 3 (three) major sections, as following :

- A. Sustainability Of Water Management; Environmental Impact In The Delta Areas
- B. Urban & Regional Sustainable Planning; Problem Solving For Soil Construction In Delta Areas
- C. Structures & Materials Engineering; Construction Management Role In Delta Areas

There are 26 paper contributors in this proceedings. The proceedings are expected to be able to contribute of problems solving in sustainable development on delta areas

Finally, the organizing committee wishes that this conference is able to provide beneficial scientific information to the participants and other concerned readers.

Semarang, 20th February 2015

A-V	" A PROPER IMPLEMENTATION OF WATER RESOURCES DEVELOPMENT, IN INTEGRATED AND SUSTAINABLE ASPECTS" (Two points of Critics on Disregard Implementation of The Act No.7 /2004) - TRI HARDHONO; BONDAN WISMANDANIKUNG	105
A-VI	WIND POWER FOR IRRIGATION WATER PUMP (A CASE STUDY IN GEDANGAN VILLAGE) - BENNY SYAHPUTRA; NAFIAH	113
A-VII	STUDY OF INSTITUTIONAL EVALUATION IN DRAINAGE SYSTEM MANAGEMENT OF SEMARANG AS DELTA CITY - HENNY PRATIWI ADI; S. IMAM WAHYUDI	118
A-VIII	THE RELATIONS BETWEEN WIND SPEED AND DISCHARGE ON WIND PUMP FOR IRRIGATION PURPOSE (THE CASE STUDY IN SETRO'S RESERVOIR) - BENNY SYAHPUTRA	125
A-IX	STUDY OF ENVIRONMENTAL IMPACT IN TOURISM DEVELOPMENT OF DELTA AREAS, BUTON UTARA REGENCY, SOUTH EAST SULAWESI - VITA KARTIKASARI; WA ODE SITTI WARSITA MAHAPATI	133
A-X	DELTA PRESERVATION AND HANDLING DIVERSION ABRASION COASTAL MODEL OF THE SUDETEN WULAN RIVER (CASE OF STUDY IN LAND ARISING COASTAL WEDUNG, DEMAK, CENTRAL JAVA – FATCHUR ROEHMAN	142
A-XI	DOWNSTREAM FLOOD CONTROL PROGRAMS BY INTEGRATED WATER RESOURCES AND FLOOD MANAGEMENT PROJECT FOR SEMARANG IP-534 – FAJAR SETIAWAN	146

SUB THEME B : URBAN & REGIONAL SUSTAINABLE PLANNING ; PROBLEM SOLVING FOR SOIL CONSTRUCTION IN DELTA AREAS

B-I	THE CAUSATIVE FACTORS OF TIDAL LAND'S UTILIZATION IN THE BORDER AREA GAJAHMUNGKUR RESEVOIR - EPPI YULIANI; AL'ASWAD; IZHATI KHOIRINA	154
B-II	DESIGN OF STACK FOUNDATION IN BERAU COAL STEAM FIRE POWER PLANT ON SOFT SILTY CLAY EMBANKMENT – WIDAYAT AMARIANSAH	161
B-III	INTEGRATED COASTAL ZONE MANAGEMENT IN ECOLOGICAL PLANNING - ETIKA SUKMA ADIYANTI	169
B-IV	DEALING WITH ISSUES IN CONSTRUCTION IN THE AREA OF RECLAMATION: SOLUTION, STRATEGY & IMPLEMENTATION – PRATIKSO; SOEDARSONO	174
B-V	INFRASTRUCTURE DEVELOPMENT STRATEGY FOR HOUSING AND SETTLEMENT IN SUB-DISTRICT COASTAL CITY OF KENDAL - JAMILLA KAUTSARY; IATHIE KUMALASARI	182
B-VI	CHARATERISTICS OF SETTLEMENT AT BALIKPAPAN COASTAL ROAD AREA (CASE STUDY: DAMAI REGENCY) - MILA KARMILAH; MUHAMMAD HAFID; ANGGA DANU WIBOWO; WAHYU UTAMI	186
B-VII	COMMUNITY PARTICIPATION OF MANGROVE FOREST MANAGEMENT (CASE STUDY: MANGROVE FOREST AREA TUGUREJO SEMARANG) – ARDIANA YULI PUSPITASARI; AGUS ROCHANI; AHMAD ALI SADIKIN	194

SUB THEME C : STRUCTURES & MATERIALS ENGINEERING ; CONSTRUCTION MANAGEMENT ROLE IN DELTA AREAS

C-I	MODEL OF PONTOON BY BAMBOO MATERIAL FOR SUBTTITUTING LAND FILL EMBANKMENT - RIFQI BRILYANT ARIEF	200
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THE CAUSATIVE FACTORS OF TIDAL LAND'S UTILIZATION IN THE BORDER AREA GAJAHMUNGKUR RESEVOIR

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ABSTRACT

One of the regional development manifestations in maximizing the field is a phenomenon of rise and subsided field utilization in the border region of Gajahmungkur reservoir, Wuryantoro for citizen farming activity. The field which is being utilized is about 1.740.340 m² or is about 174 acres. This utilization of the field is happening when the dam is subsided in the beginning of the dry season. There are many factors why the field in the border area is utilized.

The aim of research is get to know the causative factors tidal land's border area in Gajahmungkur reservoir, Wuryantoro, Wonogiri Regency is utilized. The research method that used in this research is rationalistic quantitative by collecting the data from the field survey and spreading questionnaire sheets. The analysis method which is used in this research is factor analysis and quantitative descriptive analysis.

The result which is got from this research is the utilization of rise and subsided field in Wuryantoro was happening when the dam water is subsided in the dry season and was being utilized by the citizens for cultivation-farming activity. Several factors which become the cause of the rise and subsided field utilization are field-physical factor contains field measure, the price cost of rent and the field sale; government wisdom contains citizens understanding about the regulation of the rise and subsided field utilization and also the socialization of the field utilization toward the citizen; and economic factor contains the gross level, citizen prosperity and the value of the field from the rise and subsided field, such as an easy access upon the location and the price of the ground sale. It has been being an expectation that there will be a good cooperation between Perum Jasa Tirta I and the citizen to keep the eternality and the function of Gajahmungkur reservoir.

Keywords: tidal land's; utilization; reservoir

A. Introduction

The development of an area can be run very rapidly supported by the synergistic use of space planning with the carrying capacity of the land. Development of the region can be seen in a rural area where the village is as habitat will always be a dynamic society to grow and thrive. The agricultural sector has an important role to the lives of rural communities as the average rural livelihoods is a farmer.

One form of the development of the region by maximizing the carrying capacity of the land. The tidal land's phenomena in the border region in Sub Wuryantoro Gajahmungkur reservoir for agricultural activities by people around the reservoir. Tidal land's area located in District Wuryantoro is 1.74034 million m² or about 174 ha of agricultural activities. Tidal land's use occurs when water reservoirs fell into decline during the dry season arrives

Some of the factors that led to the utilization of tidal land's in the border region of this reservoir. The existence of tidal land's use for agricultural activities can improve the economic life of the people in the District Wuryantoro. However, if the utilization of tidal land's is not managed properly feared for the future will arise a problem that will be able to interfere with the function of reservoir Gajahmungkur.

B. PURPOSE

The aim of this report is to determine the factors causing tidal land's use in the border region in Sub Wuryantoro Gajahmungkur Reservoir, Wonogiri

C. TARGET

In preparing this report, there are several objectives to be achieved in order to achieve the intended objectives, among others:

1. Analysis of tidal land's use reservoir Gajahmungkur border region in Sub Wuryantoro.
2. Analysis of the factors causing tidal land's use in the border region in Sub Wuryantoro Gajahmungkur Reservoir.

D. RESEARCH METHODOLOGY

To achieve these objectives, this study uses quantitative methods to the rationalistic approach. The data required in this research is primary data and secondary data through field observations and distributing questionnaires to the public. The sampling technique used in this study are nonprobability sampling . One type of nonprobability sampling techniques that will be used in this research is purposive sampling. Number of respondents for this study were 68 respondents. The analysis technique used to perform the analysis in this research is to use factor analysis techniques to determine the cause of the tidal land's use.

E. STUDY OF LITERATURE

Land is one of the resources that need to be considered its existence and has a vital part of life. Land is one of the natural resources are limited and can not be updated so as to consider its sustainability. Land use is a form of intervention (human intervention to the land) in order to meet their needs. Almost all human activities involve the use of land, which from time to time human activity is increasing, resulting in the increasing use of land (Jayadinata, 1999).

The linkage between land-use other use, show that there is a link between the land by human activities. Factors that affect the determination of land for an activity that is:

1. Accessibility, is a measure of the interaction from one location to another location in the city that can be measured by time or price considerations.
2. Competition in getting location. Each activity in the region will require a good-access location, so that the perpetrators of the activity will compete to get the best location indicated by the land lease.
3. Relationship with the functions of activity. Activities that have relationships with other activities will tend to cluster with consideration of the aspects of profit located.
4. The government's policy, the policy can be either directly, such as land-use plans and policies of indirect tax determination and financial policies.

CHANGES IN LAND USE

Experts argue that the land use change is caused by human needs and desires. According to McNeill (1998) factors that drive land use change is the political, economic, demographic and cultural. Political aspect is the policy pursued by the decision makers who influence the pattern of land use changes. Technology also plays a role in the shift in land use.

4. The government's policy, the policy can be either directly, such as land-use plans and policies of indirect tax determination and financial policies.

Grubler (1998) says there are three ways of how technology affects the pattern of land use, ie changes in technology have brought about changes in agriculture through increased agricultural productivity and labor productivity, changes in transportation technology improve labor efficiency, provide an opportunity to increase urbanization urban areas, and transport technologies can improve the accessibility of an area.

LAND VALUE

This theory explains the value of land and land use has a very close relationship. If the value associated with agricultural land for example, the variation in the value of land is much dependent on the level of fertility, environmental factors, the state of drainage, and the location where the land is located (related to accessibility). Arable land generally provide outputs that are more substantial than the least fertile land and consequently will have a higher value and higher price anyway (Yunus, 2000: 88).

F. OVERVIEW OF AREA STUDY

The scope of the research areas namely Sub Wuryantoro, Wonogiri, with administrative boundaries are as follows:

- | | |
|-------|------------------------|
| North | : District of Wonogiri |
| South | : District of Eromoko |

East : Gajahmungkur Reservoir of Wonogiri
West : District of Manyaran

Tidal land's that will be the location of tidal area of research is contained in District Wuryantoro. Overall tidal area is 804 hectares and is located at an elevation of ± 136.00 m to ± 138.20 m. In Sub Wuryantoro tidal land's area utilized is approximately 174 hectares spread over Gumiwang Lor village, Mlopoharjo, Genukharjo, and Sumberejo and Village Wuryantoro and Mojopuro.

G. RESULT AND ANALYSIS

Activity Analysis of Land Use in the District Gajahmungkur Reservoir Region Wuryantoro Communities in the District Wuryantoro majority are native to the average length of stay is more than 10 years. The majority of community livelihoods are as farmers and fishermen. the area around the reservoir Gajahmungkur is the activity of catching fish during the rainy season, while during the dry season community activities that occur in the area around the reservoir Gajahmungkur is agricultural farming activities by utilizing tidal land's. Changes in the activity that occurs on this Gajahmungkur Reservoir area because there Gajahmungkur Reservoir tidal area where the tidal area will appear when the water reservoir fell into decline during the dry season, whereas during the rainy season the water reservoir will cover the tidal land's to the extent of green belt land.

People still have a right to tidal land's so they are trying to take advantage of the tidal land's. Though the tidal land's is owned by Perum Jasa Tirta I as the owner and manager of Gajahmungkur Reservoir area.

Analysis of Utilization Tidal Land's Gajahmungkur resevoir in District Wuryantoro

The phenomenon of tidal land's use as agricultural land during the dry season in District Wuryantoro an important concern for landowners (Jasa Tirta I).

The existence of tidal land's use uncontrolled feared could damage the environment and the area around the reservoir Gajahmungkur garbage generated from agricultural activities can contaminate community water reservoirs. To avoid damage to the environment in the area around the reservoir Gajahmungkur.

Jasa Tirta I as the owner of the land trying to find a solution to overcome the tidal land's use for agricultural activities in the form of land lease agreement made by Jasa Tirta I with the community. In this public land lease agreement permitted to utilize tidal land's by paying the land rental price of IDR 50 / m² / year.

With the land lease agreement, Jasa Tirta I as the owner of the land is easier to supervise and manage the area around the reservoir area of environmental sustainability

Gajahmungkur that can always be maintained. With the help of the community and not cause conflict and harm society.

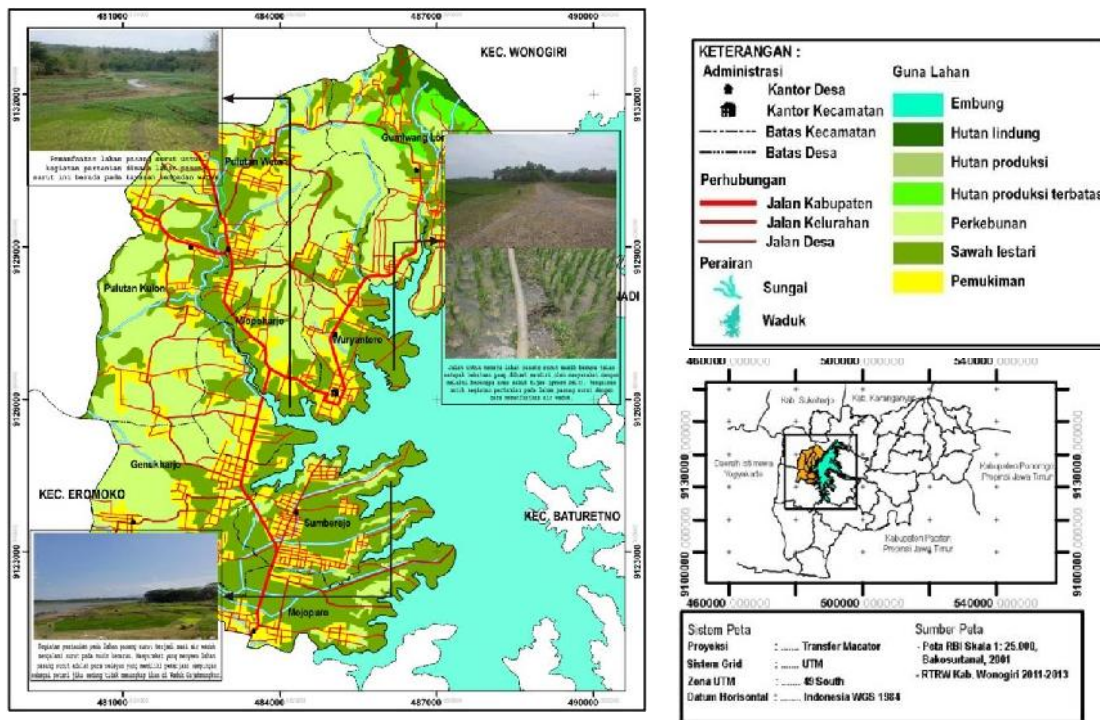


Figure 1. Land Use Map Tide In The Village And Village Wuryantoro Gumiwang Lor, Kec. Wuryantoro, Kab. Wonogiri

Analysis of Causes of Tidal Land's Border Area Gajahmungkur In District Wuryantoro.

Based on the results of the factor analysis has been carried out in this study, the importance of some of the findings of the study include:

- Validity and Reliability
 - the validity of the test results that have been performed on all indicators of questions already meets the validity of a value $r_{count} > r_{table}$ value (0.2387).
 - The results of the reliability test was performed on all indicators, the numbers generated > 0.6 and declared all indicators remained stable.

Analysis of Causes Tidal land's's Utilization

Factor analysis is done by looking at the correlation coefficient between all the parameters through the value of KMO (Kaiser Meyer Olkin) and MSA (Measure of Sampling Adequacy) and Bartlett's Test of Sphericity. If the output of KMO MSA has a value of > 0.5 , then the results of the samples that have been collected qualified and eligible to

continue in the factor analysis. The correlation between the variables in the analysis of factors must have a value > 0.5 with significance < 0.05 .

Analysis of factors which will be done next is a physical factor analysis of land, government policies, and the economy in accordance with the parameters determined for each variable. The following will explain the stages of the analysis of the factors causing tidal land's use reservoir Gajahmungkur border region in Sub Wuryantoro.

1) Analysis of Physical Factors Land

The results of the analysis of KMO and MSA without parameters tidal influence land use is the value of KMO > 0.5 in the amount of 0.542. Parameters tidal influence land use can not be included in this analysis because it has a value of MSA < 0.5 is 0.339. For each MSA values of other parameters have a value of MSA > 0.5 , so this parameter is feasible to be used in subsequent analysis that rotation factor analysis. This rotation factor analysis was conducted to determine the value of the highest factor as the lowest of the respective parameters of the variables forming the internal factors. Factor values of each parameter are as follows:

- Area of land use, value factor 0.855.
- The rental price of land, the value factor of 0.855.
- The activities of buying and selling land, the value factor 0.451.

2) Analysis of Government Policy Factors

The results of the analysis of KMO and MSA without parameters influence the use of technology in border land use reservoir is KMO value > 0.5 is equal to 0.703. Parameters influence the use of technology in land use reservoir boundary can not be included in this analysis because it has a value of MSA < 0.5 is 0.282. For each MSA values of other parameters have a value of MSA > 0.5 , so this parameter is feasible to be used in subsequent analysis that rotation factor analysis. This rotation factor analysis was conducted to determine the value of the highest factor as the lowest of forming each of the variable parameters of external factors. Factor values of each parameter are as follows:

- Community perception about the rules of the utilization of tidal land's on the border of the reservoir area, the value factor of 0.852.
- Method of delivery (socialization) utilization of tidal land's in the border area of the reservoir to the community, the value factor of 0.818.
- Community perception about the function of riparian land use reservoir, the value factor 0.755.
- community perception related to protected areas, the value factor 0.696.

Analysis KMO and MSA without parameter of level soil fertilizer and value of road condition KMO is 0,75 (KMO $> 0,5$). parameter of level fertilizer and value of road

condition can not involve this analysis because value $MSA < 0,5$. Level of soil fertilizer value $MSA 0,477$ and road condition value $0,479$. This rotation factor analysis was conducted to determine the value of the highest factor as the lowest of the respective parameters of variables forming economic factors. This rotation factor analysis was conducted to determine the value of the highest factor as the lowest of the respective parameters of variables forming economic factors. . Factor values of each parameter are as follows:

- Price of land , factor value $0,731$.
- Level of income, factor value $0,670$.
- Level of welfare, factor value $0,630$.
- Level of accessibility location factor value $0,934$.

H. CONCLUSION

The results of this study concluded:

1. District of Wuryantoro, in the area around the reservoir Gajahmungkur community activities that occur during the rainy season is catch fish in reservoirs Gajahmungkur, while during the dry season community activities that occur in the area around the reservoir Gajahmungkur is agricultural farming activities by utilizing tidal land.
2. The land lease agreement made between Perum Jasa Tirta I with the community is one of the efforts made by Perum Jasa Tirta I to facilitate the monitoring and management activities of the area around the reservoir as well as preserving the function of reservoir Gajahmungkur.
3. The analysis of the factors that have been done show that the factors causing tidal land use in the border region in Sub Wuryantoro Gajahmungkur Reservoir is as follows:
 - Physical factors Land: Area of land use; land rental rates; buying and selling of land.
 - Factors Government Policy: Community understanding of tidal land use rules in the border region of reservoirs; methods of delivery (socialization) utilization of tidal land in the border area of the reservoir to the public; public understanding of the functioning of riparian land use reservoir; public understanding related to protected areas.
 - Economic factors: the selling price of land; income level; level of social welfare; level of ease of use of land to reach locations.

I. RECOMMENDATIONS

Recommendations For the Government or business Reservoir Gajahmungkur (Perum Jasa Tirta I) and community.

- Perum Jasa Tirta I as the owner of the land began to define the limits and rules in Gajahmungkur reservoir management, such as the prohibition to harness tidal land for cultivation in order to maintain the sustainability of the reservoir function.
- There needs to be a re-review related to the decree of the governor of the Province of Central Java No. 611/22/1984 of granting the petition of planting crops in the reservoir inundation Gajahmungkur Winton and then followed up with the SK Regent Regional Level II Winton No. 254 of 1986 about licensing plantings on tidal reservoir Gajahmungkur Winton, because the decree could no longer be applied to the reservoir Gajahmungkur with current reservoir conditions began having siltation resulting from erosion and sedimentation.

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