

Web-Based Spatial Information System for Fisheries Potential in Cirebon Regency

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ARTICLE INFO	ABSTRACT
Article history: Received May 19, 2023 Revised June 20, 2023 Accepted July 21, 2023 Keywords: Fishery Potential; Spatial Information System; Web.	Cirebon Regency, which is one of the easternmost regencies in West Java Province with an area of 989.70 Km², a coastline of 54 Km and a pond area of 7,500.0 Ha, makes Cirebon Regency one of the potential areas for fishery business in West Java province. Based on fishery production development data for 2007, Cirebon district produced fishery production of 55,708 tons. However, in 2008 this value decreased to 52,342.40 tons or a decrease of 6.04%. (Marine and Fishery Service 2008: 35). The decline in production results is due to various factors including the lack of utilization of existing potential areas, lack of information, limited use of technology in the field of fisheries and so on. The lack of information about fishery resources causes a lack of optimal utilization of existing fishery resources, so it is necessary to use information technology such as the development of a spatial information system for fishery potential in Cirebon Regency. This information system displays potential fishery locations, for example pond locations, Fish Landing Bases and Fishery Product Processing Sites and is presented in spatial form and presented on a web-based basis, this will be easy to use, as well as the completeness of the data presented can be used as a reference source for local governments in order to increase the potential of the existing fisheries sector.

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1. INTRODUCTION

Fishery resources are natural resources that can generate high income for a region or government. Indonesia, with a sea area of around 5.8 million km² and a coastline of approximately 81,000 km, has a large potential for economic income from fisheries. Likewise with Cirebon Regency which is one of the easternmost districts of West Java Province with an area of 989.70 Km², a coastline of 54 Km and a pond area of 7,500.0 Ha, Making Cirebon Regency one of the potential areas for fishery business in the province of West Java.

Geographically, Cirebon district is one of the easternmost districts of West Java Province with a latitude of 6°30' - 7°00' South Latitude and 108°40' - 108°48' East Longitude. To the north it is bordered by Indramayu Regency, the city of Cirebon and the Java Sea, to the south by Kuningan Regency, to the west by Majalengka Regency and to the east by Brebes Regency, Central Java

Province. The farthest distance east-west is 54 km and north-south 39 km covering 40 districts, 412 villages and 12 sub-districts with the regency capital in Sumber.

Based on fishery production development data for 2007, Cirebon district produced fishery production of 55,708 tons. However, in 2008 this value decreased to 52,342.40 tons or a decrease of 6.04%. (Marine and Fishery Service 2008: 35). The decline in production results is due to various factors including the lack of utilization of existing pond potential areas, lack of information, limited use of technology in the field of fisheries and so on.

Geographic Information System (GIS) is a computer-based system that is used to map conditions and events that occur on earth and can also be used to store, manipulate and analyze geographic information. This technology is growing rapidly in line with the development of information technology or computer technology. Information on the surface of the earth has been presented in the form of maps for centuries. General purpose maps depict the topography of an area or the boundaries (administrative) of a region or country. Meanwhile, thematic maps specifically display spatial distribution of features such as geology, geomorphology, soil, vegetation, or other natural resources.

GIS data management will meet the public's need for this information because it is presented in a spatial form, this will be easy to use, as well as the completeness of the data presented, plus if it is presented on a web basis so that it can be accessed by anyone. However, until now the Cirebon Regency Maritime Affairs and Fisheries Service does not yet have an information system which can be used as a reference source for local governments in order to increase the potential of the existing fisheries sector.

Web applications are described as interacting HTTP-based applications that can receive processing machines (Hadley, 2006). Currently the web is one source of information that is widely used. Various web applications are made with the aim that users can interact with information providers easily and quickly through the world of the internet. Web applications are no longer limited to providing static information. But also able to provide information that changes dynamically by connecting to the database (Kadir, 2002).

Based on the description above, I as the writer are interested in raising the topic "Web-Based Spatial Information System for Fisheries Potential in Cirebon Regency". With the hope of being able to provide an alternative solution for the Cirebon Regency Maritime Affairs and Fisheries Service in providing an overview of a potential location in the fisheries sector in detail and as one of the manifestations of implementing Law no. 31 of 2004 concerning Fisheries.

2. RESEARCH METHODS

The author conducts a literature study by reading and studying books related to system analysis and design, web programming and books that support the topics to be discussed in the preparation of this thesis. In addition, the authors also visit websites related to the topic in this thesis. Tables and Figures are presented centrally, as shown in Table 1 and Figure 1, and cited in the text before appearing. To carry out a system development requires a system development methodology, the system development methodology that the authors use in this study is the System Development Life Cycle (SDLC) using a linear sequential model. At this stage the authors collect needs that are intensified and focused, especially on software.

3. RESULTS AND DISCUSSION

Research result

1. General Description of Cirebon Regency

Cirebon Regency is part of the province of West Java which is located in the east and is the boundary, as well as the gateway with Central Java Province. In the agricultural sector, Cirebon Regency is one of the rice producing areas which is located on the northern coast line (North Coast).

The sub-district area which is located along the north coast route (Pantura) is included in the lowlands which has a height of between 0 to 10 meters above sea level (asl), while the sub-district area which is located in the south has an altitude of between 11-130 meters asl. . Climatic factors

and rainfall in Cirebon Regency are influenced by its natural conditions, which mostly consist of coastal and hilly areas, especially the northern, eastern and western parts. While the southern area is a hilly area.

Cirebon Regency is traversed by 18 rivers which originate in the south. The rivers in Cirebon Regency which are classified as large include the Cisanggarung, Ciwaringin, Cimanis, Cipager, Pekik and Kalijaga rivers. In general, the large rivers mentioned above are used for irrigating rice fields in addition to bathing, washing and as public toilets.

2. Profile of Maritime Affairs and Fisheries Service

The Maritime Affairs and Fisheries Service was formed based on Law Number 32 of 2004 concerning Regional Government whose implementation is described in Cirebon Regency Regional Regulation Number 21 of 2004 concerning the establishment of the Marine and Fisheries Service and Cirebon Regency Regional Regulation Number 20 of 2004 concerning the organization and work procedures of the Maritime Service and Fisheries (Regional Gazette of Cirebon Regency Number 35 of 2004 series D.18).

Law Number 8 of 2003 concerning Organizational Guidelines concerning the performance of the Maritime Affairs and Fisheries Service must be supported through good and professional services by the Marine and Fisheries Service apparatus. Likewise, the relationship and work mechanism between the executive and the legislature are directed at creating a unified movement and steps in a harmonious work chain.

The Main Tasks of the Maritime Affairs and Fisheries Service are listed in Article 4 of Regional Regulation Number 19 of 2004 concerning the Establishment of the Maritime Affairs and Fisheries Service, as follows; Management of Service Administrative Affairs; Formulation of Guidance and Development Technical Policies in the Maritime and Fisheries Sector; Planning of fostering activities in the context of efforts to increase fishery production; Implementation of coaching activities in the context of efforts to increase fishery production; Implementation of business development activities in the Maritime and Fisheries Sector; Implementation of Exploration and Conservation Development activities; Granting licenses and public services in the Maritime and Fisheries Sector; Guidance and Supervision of Service Technical Implementation Units in the field of Maritime Affairs and Fisheries; Implementation of other functions given by the Regent in accordance with his authority.

Based on the main tasks and functions by analyzing the potentials/strengths/opportunities, constraints and challenges in the development of Maritime Affairs and Fisheries as well as paying attention to the strategic environment and Regional Government policies, the Cirebon Regency Maritime Affairs and Fisheries Service, based on what has been stated above, it is understood that the activities Maritime Affairs and Fisheries is a part of the implementation of the duties and authorities of the Regional Head as a whole which must be carried out optimally in order to create the implementation of the main tasks, functions and roles of the service towards the realization of a government system that has high accountability. This is where the hope for the creation of a clean government will emerge.

Discussion

At this stage the author conducts an analysis of both the current system and also an analysis of the proposed system to overcome the problems faced by the Cirebon Regency Maritime Affairs and Fisheries Service. The following are the steps taken at the analysis stage are as follows,

1. Description of the Running System

The stages of the Cirebon Regency fishery potential system process that are currently running can be seen in the document flowchart image. The Cirebon district fishery potential system process begins with the process of viewing a list of Cirebon district fishery locations.

All fishery places or locations are collected in data to map the fishery potential of each place. The next process is that from each place that has been recorded, grouping and selection of potential places for Cirebon district fisheries are carried out. Data on fishery locations that have been made are then collected. into one based on sub-district and village locations, a list of fishery

locations is given to the sub-district. The sub-district party separates the list of locations based on the village that is the territory of the sub-district. The list is distributed to a lower level, namely the village. The village disseminates information on fishery potential to the general public,

2. Weaknesses of the Current System

Based on the data flow that has been described, it can be concluded that there are some weaknesses in the system that is being implemented, namely, the manual processing of data regarding the management system for fisheries and marine potential in Cirebon district. Manual data processing is vulnerable to loss due to human error or disaster. There are difficulties in finding data or information about the fisheries and marine potential of Cirebon district. Existing information is sometimes inappropriate and not managed properly.

There is no integrated system for short and long term plans for fishery and marine potential geographically in Cirebon district. The development of fishery potential is not yet optimal because not all of the available data is collected and is in accordance with the current situation. Information that reaches the community is still manual and often does not reach to people who need fishery potential locations to improve their economy.

3. Problem Analysis

Based on the weaknesses in the system running above, the authors describe each of these weaknesses as a problem as outlined in Table 1 as follows:

Table 1. Cause and Effect Analysis

CAUSE-AND-EFFECT ANALYSIS	
Problems	Causes and Effects
Manual processing of data on the fisheries and marine potential management system of Cirebon district	■ Data is not neatly arranged and incomplete ■ Vulnerable to data duplication ■ Data processing errors both input and output data ■ Vulnerable to data loss - Goodhuman error or disaster.
Difficulties in finding data or information about the fisheries and marine potential of Cirebon district	■ People often have to go back and forth to find information ■ Information often incomplete and not updated with the current situation ■ Often the information received is wrong and inappropriate.

4. Problem Solution

Table 2. Problem Solutions

No.	.	Proposed solutions
1.	Data is not neatly arranged and incomplete. This makes data duplication vulnerable. Data processing errors both input and output data. Vulnerable to data loss either human error or disaster.	Making a system that can store data on fishery potential into digital documents and can process data that can provide information on fishery potential and can be accessed anytime and anywhere that is connected to the network Internet.
2.	The difficulty in finding data or information makes people have to frequently go back and forth to find information. Information is often incomplete and not updated with the	Making a system that can store data on fishery potential into digital documents and can process data that can provide information on

	current situation and the information received is wrong and inappropriate.	fishery potential and can be accessed anytime and anywhere that is connected to the network Internet.
3.	There is no integrated system yet aboutshort and long term plans	System making canstore fishery potential data
	to potentialfisheries make	into digital documents and

5. Proposed System Analysis

In the description of the problems in the ongoing system that has been discussed previously, the stages of the proposed Cirebon district fishery potential process can be seen in the System Flowchart image as, In the description of the problems in the ongoing system that has been discussed previously, the proposed Cirebon district fishery potential process stages can be seen in the picture System Flowchart.

The facilities that must be provided by the proposed system include the following, a system that can store data on the location of fishery potential in Cirebon district. And can be easily accessed by the user, The system can display a map of the location of potential fisheries with certain parameters and sizes that have been determined, Provides information on potential areas in the Cirebon district fisheries that can be used by users for fishing purposes, Restricts access to the use of the system by how to apply privileges.

The fishery potential map is the main menu of the system in which there is a map image showing the location of the Cirebon district fishery potential. The potential map also contains data on fishery potential and the location of the fishery potential. The tabular data menu is a menu that functions to display in more detail fishery potential, fisheries utilization results and fisheries statistics for Cirebon district. The profile menu contains a menu that is used to display information and profiles of the Cirebon district to the general public or system users.

The news menu is a menu that functions to display information related to fisheries that is useful to support the information needs of the community. The news menu can also contain activities or events carried out by the Cirebon district marine and fisheries service. The guestbook menu is a menu provided to interact with the public or users by leaving messages or questions about the fishery potential of Cirebon district.

4. CONCLUSION

The development of the Cirebon District Fisheries Potential Information System can be the right solution for the Cirebon District Fisheries and Marine Service. This information system provides information on the fisheries potential of the Cirebon district in the form of spatial data with the contributions as follows. This information system can accommodate all data on the fisheries potential of the Cirebon district, making it easier for the Cirebon District Maritime Affairs and Fisheries Service to implement it. The Cirebon district fisheries potential information system This is Web-based so that it can be accessed by interested parties and the wider community. This system can map potential fishery locations in Cirebon district and the information for implementing steps is then taken.

REFERENCE

- Aini, Anisah, 2010, Geographic Information System Understanding and Application. [online] Available: [http://p3m.amikom.ac.id/Geographical Information System, Understanding and Utilization.pdf](http://p3m.amikom.ac.id/Geographical%20Information%20System,%20Understanding%20and%20Utilization.pdf). [July 16, 2010, 8:57]
- Atmoko, Tjipto, 2010, Standard Operating Procedures (Sop) and Performance Accountability of Government Agencies, http://www.resources.unpad.ac.id/standar_operational_prosedur.pdf. [19 September 2010 18:35]
- Aziz, Muhammad & Pujiono, Slamet. 2006. Desktop and Web-Based Geographic Information Systems. Yogyakarta: Gava Media.
- Central Bureau of Statistics. 2009. Cirebon Regency in Figures 2008. Jakarta: Central Bureau of Statistics.

- Ministry of Maritime Affairs and Fisheries. 2006. Annual Report of the Office of Maritime Affairs and Fisheries of Cirebon Regency, 2005. Cirebon: Office of Maritime Affairs and Fisheries.
- Department of Maritime Affairs and Fisheries. 2009. 2008 Annual Report of the Cirebon District Maritime Affairs and Fisheries Service. Cirebon: Maritime Affairs and Fisheries Service.
- Hartono, Jogiyanto. 2005. Analysis and Information Systems: Theory Structured Approach and Business Applications. Yogyakarta: ANDI Publisher
- Kadir, Abdul. 2008. Practical Guidance for Learning Databases Using MySQL. Yogyakarta: Andi.
- Marine and Fisheries Ministry. 2010. Fisheries and Maritime Affairs in Figures 2009. Jakarta: Center for Data, Statistics and Information Ministry of Maritime Affairs and Fisheries.
- Kristanto, Andi. 2003 Design of Information Systems and Applications. Yogyakarta: Gava Media.
- Ladjamudin Bin Al-Bahra. 2004. Database System Concepts and Their Implementation. Yogyakarta: Science Graha.
- Pasha, Alvira. 2008. Web-based Geographic Information System for Female Dormitory TPB IPB Using ALOV Map [Thesis]. Bogor: Bogor Agricultural Institute.
- Government of the Republic of Indonesia. 2004. Law Number 31 of 2004 concerning Fisheries. Jakarta: Government of the Republic of Indonesia.
- Prahasta, Eddy. 2007. Geographic Information System; Building GIS Web-Based Applications with Mapserver. Bandung Informatics
- Riqqi, Akhmad, & Nganro, Noorsalam, 2010, Sig Utilization Prototype for Pond Area Management.[online]Available: http://www.hayati.itb.ac.id/artikel/Prototipe_utilization_SIG.pdf. [19
- Sutarman. 2003 Building Web Applications with PHP and MySQL. Yogyakarta, Graha Ilmu.
- T. Nugrahani, 2010, Fisheries Geographic Information System. [online] Available: <http://www.perikanandiy.go.id>, [July 16 2010 9:35]
- Wahyuardi, Bayu Wicaksana, 2010, Running AlovMap as a Desktop Application with. Net. [online] Available: <http://ilmucomputer.org/wp-content/uploads/2009/02/bayu-webgisalovmap.zip>. [July 16, 2010, 13:16]