DEVELOPMENT OF GIS-BASED DECISION SUPPORT SYSTEM FOR SMALL ISLAND
(A Case Study in Ndana Island, Nusa Tenggara Timur)

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GRADUATE SCHOOL
BOGOR AGRICULTURAL UNIVERSITY
2006
DEVELOPMENT OF GIS-BASED DECISION SUPPORT SYSTEM FOR SMALL ISLAND
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A thesis submitted for the degree of Master of Science of
Bogor Agricultural University

MASTER OF SCIENCE IN INFORMATION TECHNOLOGY
FOR NATURAL RESOURCES MANAGEMENT
GRADUATE SCHOOL
BOGOR AGRICULTURAL UNIVERSITY
August 2006
STATEMENT

I, Ati Rahadiati, here by stated that this thesis entitled:

Development of GIS-based Decision Support System for Small Island

(A Case Study in Ndana Island, Nusa Tenggara Timur)

are results of my own work during the period of February until July 2006 and that it has not been published before. The content of the thesis has been examined by the advising committee and the external examiner.

Bogor, August 2006

Ati Rahadiati
ACKNOWLEDGEMENT

Alhamdulillah. Thanks to The Almighty Allah who always give His endless Grace and Blessing on me. The success of this study would not have been possible without various contribution and support from many individuals that I would like to express my deep gratitude to all of them.

First, I would like to express my thanks and gratitude to BAKOSURTANAL especially for Chief of Center for Marine Resources Survey for gave me the opportunity to join this program and also for facilities and financial support during my study.

Many thanks go to my supervisors Dr. Tania June, M.Sc. and Dr. Dewayany Sutrisno, M.App.Sc. for their valuable suggestions, guidance and word of encouragement and scientific support. Without their contribution and guidance, this thesis would be of less quality.

My sincere thank to external examiner Dr. Gatot H. Pramono for suggestions and comments that improve this thesis. High appreciation goes to the lectures of MIT who taught me with important knowledge. Thanks also to The MIT management and staffs as well as IPB post graduate for supported our administration, technical aspects and the facilities.

I wish also to thanks to my friends and colleagues at Center for Marine Resources Survey for their support, for gave positive ideas and great discussion and supported data needs for this thesis.

Special thanks to all of MIT students especially my class mates, with whom I share laughs and pressures during my study, for our togetherness, helpful, and solidarities.

Finally, my special heartfelt gratitude goes to my family for their prayer, support, encouragement, and everything.

Hopefully this thesis can be useful.
CURRICULUM VITAE

Ati Rahadiati was born in Bogor, West Java, at July 18, 1969. She received her undergraduate diploma from Bogor Agricultural University in 1993 in the field of Agrometeorology. Since 1995 to present, she works for National Coordinating Agency for Survey and Mapping (BAKOSURTANAL).

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ABSTRACT


Ndana Island in East Nusa Tenggara province is selected as the study area, because the island was classified as small island, located in the Australian border, and need a special management for achieving sustainable natural resources especially at marine area. The development of GIS-based DSS will be has some advantages for Ndana Island such as increasing and protecting the carrying capacity of border territory; using natural resources potencies with sustainable management; increasing income of local people; and developing an isolated island.

The objectives of this research are to identify and analyze potencies of Ndana Island, to develop prototype of GIS-based Decision Support System as a tool for analysis of decision making and to propose potential solutions based on sustainable management of Ndana Island.

There are four main activities to comply this research are data collection and preparation, database design and implementation, data analysis, and graphical user interface. The suitable area for coral reef conservation area in Ndana Island will be analyzed based on ecology, economic and social factors using GIS analysis. Results from this analysis are three zones in conservation area: core zone, buffer zone and use zone which core zone should be a closed area for development, accessible only for research activity. Buffer zone and use zone areas can be analyzed further for diving suitability.

Result of this research is the suitable area for coral reef conservation in Ndana island are S1 (highly suitable) for core zone, S2 (moderately suitable) for buffer zone, S3 (marginally suitable) for use zone and N (not suitable) for non-conservation area. Percentage of S1 is 0.29%, S2 is 3.01%, S3 is 75.58% and N is 21.12%. In buffer and use zone of conservation area, there are 31.33 hectares is moderately suitable (S2) and 146.27 hectares is marginally suitable (S3) for diving suitability.

Based on spatial suitability and economic valuation, scenario IV is the best management to apply in coral reef area of Ndana Island, which has the biggest value of NPV, Rp. 86,767,185,416. In scenario IV there are zonation area for tourism, fisheries and protected area with ecology, economic and social consideration. Hopefully this scenario can increase income of local people with sustainable management of natural resources. With this method can help improve coral reef conservation and management, but the level of detailed analysis required depend on the use of data and the value estimation.

This research has been developed graphical user interface using Microsoft Visual Basic and MapObject that makes the system easy to understand, handle and use by the user means it can be helpful for the user.
Research Title : Development of GIS-based Decision Support System for Small Island (A Case study in Ndana Island, Nusa Tenggara Timur)

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Date: August 25, 2006
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