Proceedings

International Conference on Science and Technology (ICST)

Vol. 1, Juni 2020

Organized by Institute for Research and Community Services
University of Mataram, Indonesia

Vol 1 (2020)

Proceedings International Conference on Science and Technology (ICST)

Table of Contents

Articles

Screening Of Phytase - Producing Bacteria As Probiotic Candidates Of Poultry PDF 1-8
Muh. Aidil Fitriyan Fadjar Suryadi, Anwar Rosyidi, Muhamad Ali

Organic and Bio-fertilizer Application to Increase Yield of Black Rice under Aerobic Irrigation System and Intercropping with Peanut PDF 9-15
Wayan Wangiyana, I Ketut Ngawit, Nihla Farida, Ni Wayan Dwiani Dulur, Siti Zainab

Design and Simulation PD Descriptor Observed-Fault Based Detection and Isolation Using Computed Torque Control Law on Robot Manipulator Puma 560 6-DOF PDF 16-25
Titi Andriani, Muhammad Hidayatullah, Shinta Esabella

Received Signal Strength of WIFI Devices for Indoor Positioning Using Neural Network LVQ Method PDF 26-31
Muhammad Yusuf Yahya, Misbahuddin Misbahuddin, Giri Wahyu Wiriasto

The Approach of Soil Parameter Factors and Vehicle Axle Load in Road Damage Handling Post-Earthquake SR 7.0 at North Lombok Regency PDF 32-41
I Wayan Suteja, I A O Suwati Sideman, I D G Wira Pariangga

Survey of Geothermal Energy Potential using Geomagnetic Method in Sembalun Timba Gading, Lombok PDF 42-47
Hasmil Hadi, Teti Zubaidah, Ida Ayu Sri Adnyani, Paniran Paniran, Bulkis Kanata, Dwi Ratnasari

Stability and insulation of sandwich reinforced concrete slab with lightweight concrete core under flexural loading exposed to fire PDF 48-57
Suryawan Murtiadi, A Akmaluddin, Teti Handayani, Siti Nur Rahmah Anwar

Detection of Sugar Content in Mango Fruit using Coaxial Cavity Resonator PDF 58-65
Cahyo Mustiko Okta Muvianto, Kurniawan Yuniarto, Suthami Ariessaputra, Budi Darmawan, Made Yadnya, A Rachman

CFD Simulation of Velocity Effect on Flow Characteristic of Biofluid in Microchannel Permeable Membrane PDF 66-72
Nur Kaliwantoro, IGNK Yudhayadi, Feri Fadli, I Kade Wiratama, Sujita Darmo

Effectiveness of Aromatherapy for the Fulfillment of Sleep Quantity of Cancer Patients in West Nusa Tenggara Provincial General Hospital PDF 73-78
Masadah Masadah, Sitti Rusdianah

Performance Improvement of Grid Tie Inverter on Microgrid of Solar Photovoltaic PDF 79-87
Abdul Natsir, Supriyatna Supriyatna, Ni Made Seniari, Ida Ayu Sri Adnyani, Sabar Nababan

Profile of Glucose, Lipid, Blood Pressure and Its Association With Cardiovascular Diseases at The Community Health Centers in Bima City, Indonesia PDF 89-98
Martiningsih Martiningsih, Dahlan Dahlan, Indra Rahmad, Sitti Rusdianah, Nurul Inayati

Strengthening the Mechanical Properties of Polyester Composites by Pineapple Leaves Fiber PDF 99-103
Dian W. Kurniawidi, Lina Handayani, Siti Alaa, Marzuki Marzuki

The effects of continuously high temperatures on apical development and yield of four varieties of wheat PDF 105-109
Akhmad Zubaidi

Analysis of Wood Pellet Quality from Calliandra Callothyrsus, Gliricida Sepium, and Sawdust as New and Renewable Energy PDF 110-115
Susi Rahayu, Sitti Hilyana, Embun Suryani, Nazmi Herlina Sari, Muhamad Ali

Identification of Seismic Vulnerability Using Microtremor Data in Lingsar District West Lombok Regency PDF 116-122
Romi Mirajullayli, Syamsuddin Syamsuddin, Suhayat Minardi

Viability Of Bacteria Used In Production Of Synbiotics For Laying Hens PDF 123-128
Khairil Anwar, Anwar Rosyidi, Muhamad Ali

The Investigation of Submerged Breakwater Influence on Its Coastal Profile Behind PDF 129-134
Eko Pradjoko, Nurwahyu Hidayati, Agus Suroso, Baiq Dewi Suci Rukminingsih

Effect of Feeding Batacomplete Feed Block on Body Weight of Etawah Grade Dairy Goats in Sejati Farm PDF 135-138
Muhammad Amin, Muhammad Prasetyo Nugroho, Chairussyuhur Arman

Design and Analysis Bio-composite Material for Mono Leaf Spring using Finite Element Method PDF 139-148
Amirin Kusmiran, Rita Desiasni, Muhamad Hidayat

The Degree, Radius, and Diameter of Coprime Graph of Dihedral Group PDF 149-154
Abdul Gazir S, I Gede Adhitya Wisnu Wardhana, Ni Wayan Switrayni

Analysis Chemistry Science Literacy Abilities Of High School Students In Mataram PDF 156-162
Rabiatul Adawiyah, Yayuk Andayani, Agus Abhi Purwoko

Direct Measurement of Strength Signal 4G for Simulation Best Service Coverage BTS (Base Transceiver Station) PDF 163-166
Made Sutha Yadnya, I Wayan Sudiarta

Drug Abuse Patterns and Their Manifestations Toward Teenager Behavior: Phenomenon of Teenagers Lifestyle Behavior in Bima PDF 167-172
Ade Wulandari

Analysis of Coliform Bacteria As A Water Pollution Indicator In Unus River PDF 173-182
J. Ani Safitri, Khairuddin Khairuddin, DAC Rasmi

Mapping of Magnetic Flux Density on Mini Magneto-static Flux Manipulator PDF 183-187
Ishfa Kautsari Puteri Suryani, Teti Zubaidah, Ida Bagus Fery Citarsa, Bulkis Kanata, Paniran Paniran

Hypertension Risk Factor Characteristics in the City of Mataram and Surabaya PDF 188-192
Ridawati Sulaeman, Dewi Purnamawati, Jujuk Proboningsih, Rusmini Rusmini

Designing A Nonparametric Kernel Regression Package In Python Programming Language PDF 193-197
Lalu Abd Azis Mursy, Mustika Hadijati, Irwansyah Irwansyah

Design and Build an Android-Based Digital Academic Guidebook Application at Universitas Teknologi Sumbawa PDF 198-208
Shinta Esabella, Muhammad Hidayatullah, Titi Andriani, Ficky Fahruddin

Some Characteristics of Prime Submodules of Gaussian Integer Modulo over Integer PDF 209-213
Rina Juliana, I Gede Adhitya Wisnu Wardhana, Irwansyah Irwansyah

Preconcentration of mercury anorganic by reducting ion Hg2+ to Hg0 using copper PDF 214-218
Lale Budi Kusuma Dewi, Ida Bagus Rai Wiadnya

Improving The Accuracy of Face Recognition Using Residual Network (Resnet) PDF 219-223
Muhammad Sya'roni Mujahidin, Misbahuddin Misbahuddin, Bulkis Kanata

The Effect of Transformer Models in Three Phase Power Flow Study PDF 224-232
Agung Budi Muljono, Yuda Pratama Putra Kesawa, I Made Ari Nrartha

Multiple Character Modification for Huffman Algorithm PDF 233-239
Wilham Reyssan, Budi Irmawati, Fitri Bimantoro

The Effect Of Scientific Attitude And Motivation To Learn The Creative Thinking Skills Of SMA/MA Student In Montong Gading Lombok Timur PDF 240-248
Laili Hidayati, Lalu Rudyat Telly Savalas, Agus Abhi Purwoko

Interpretation of Subsurface Based on Magnetic Data in the Geothermal Prospect Area of Sembalun Lawang, Lombok PDF 249-254
Haqullah Nur Ukassyah, Paniran Paniran, Teti Zubaidah, Cipta Ramadhani, Rosmaliati Rosmaliati, Misbahuddin Misbahuddin

The Handling of Missing Data At Nurul Bayan Geomagnetic Station, Lombok PDF 255-260
Khairunnas Khairunnas, Budi Irmawati, Teti Zubaidah, Bulkis Kanata, Arik Aranta, Dwi Ratnasari

Correlation of Geomagnetic Signal for Earthquake Studies in 2016-2017 between Indonesian, Australian and Guam PDF 261-266
Kenya Damayanti P, Bulkis Kanata, Teti Zubaidah, Abdullah Zainuddin, Made Sutha Yadnya

Mechanical Properties of Cold -Formed Steel Under Tensile Testing PDF 267-270
Siti Nur Rahmah Anwar, Buan Anshari, A. Sjamsjar Rachman, Suryawan Murtiadi, Nurchayati Nurchayati

Analysis Set-Up of Blower Utilized for Wind Turbine Performance Experiment PDF 271-276
I Kade Wiratama, I Gusti Ngurah Yudhiyadi, Nur Kaliwantoro

Database Model to Optimize Query for Student Evaluation System PDF 277-281
LAS Irfan Akbar, A Sjamsjiar Rachman, DjulFikry Budiman

Flood Early Warning System: Development and Installation of Automatic Rainfall Recorder PDF 282-286
Sasmito Soekarno, Ery Setiawan, Eko Pradjoko, Hartana Hartana

The Ability of Wharton's Jelly Derived Stem Cell as Source of Mesenchymal Stem Cells PDF 287-290
Ari Khusuma, Suhartiningsih Suhartiningsih, Gita Pratama

Palm Print Recognition Using CANNY Edge Detection, Gray Level Co-Occurrence Matrix and Classified Using K-Nearest Neighbor PDF 291-303
Rahayu Utari, Fitri Bimantoro, I Gede Putu Wirawan Wirarama Wedashwara

The Nursing Home Care Module in Improving Self Care Agency of Patient with Pulmonary Tuberculosis in the City of Bima, West Nusa Tenggara PDF 304-311
Muhtar Muhtar, Aan Dwi Sentana

Suitability and Carrying Capacity of Utilization in Gitanada Protected Area PDF 312-319
Sitti Hilyana, Sadikin Amir, Nurliah Nurliah, Soraya Gigentika, Alfian Pujian Hadi

Earthquakes and tsunamis in Lombok, NTB: from hazard assessment to crisis management PDF 320-326
Lavigne F, Jean V, Suwardji Suwardji, Kusnadi Kusnadi, Edong Edong, Hiden Hiden, Syamsuddin Syamsuddin, Reghezza-Zitt M, Mutaqin B, Malawani M.N

Spatiotemporal Predation Pattern of The Loggerhead Nests on Dalyan Iztuzu Beach Turkey PDF 327-340
Muhamad Soimin, Ayfer Sirin, Doğan Sozbilen, Eyup Baskale, Yakup Kaska

Proceedings International Conference on Science and Technology (ICST)

e-ISSN: 2722-7375 pp: 312-319, Vol. 1, Juni 2020

Suitability and Carrying Capacity of Utilization in Gitanada Protected Area

Sitti Hilyana*[1], Sadikin Amir[1], Nurliah[1], Soraya Gigentika[1], Alfian Pujian Hadi[2]

[1] Department of Fisheries and Marine Sciences Faculty of Agriculture
Mataram University

[2] Faculty of Geography of Muhammadiyah University

correspondence author: sittihilyana@unram.ac.id

Abstract. Various economic and resource activities in Gitanada protected area cause serious mangrove, coral reef and seagrass ecosystems degradation. The aims of this research were study land suitability,determine carrying capacity, and optimize of utilization of marine protected area. The methods employed in this research as: field survey for assessing the biophysics characteristics of the Gitanada protected area; Geographycal Information System (GIS) for suitability analysis; Carrying capacity analysis using feasibility. The results of this research showed that condition of mangroves vegetation, live coral and seagrass were categorized from poor to good. 132 ha and 132.99 ha were suitable for molusc and seaweed culture with total production 1,056 tons per year and 1,063 tons per year respectively. 258.11 ha and 1212.35 ha were suitable for scuba diving and snorkeling and coastal tourism with the capacity of tourism were 16,183 person/year and 484,800 person/year respectively. While the suitable for mangrove tourism was 1010.65 ha with 404,261 person/year tourism capacity.

Keywords: suitability, carrying capacity, utilization, protected area

1. Introduction

The Gitanada Conservation Area are three small islands in West Lombok Regency. The condition of clear waters and high level of brightness and biodiversity with high endemicity, beautiful landscapes, and strategic geographical location make the Gitanada region very potential for the development of capture fisheries and tourism, so that the area is used as a source of livelihood for the community both around and from outside region.

The basic problem in establishing Gitanada is the ineffective management to conflict of interest, where the community uses resources without considering resource sustainability. so that the available resources experience a threat. Considering that the area is a source of livelihood for the surrounding community, its management needs to be directed to the concept of management that is able to accommodate various interests through a model of area

management based on suitability and carrying capacity. Every activity in the utilization of regional space must be carried out by considering the suitability criteria of conservation-based land.

The most optimal use of conservation area space, it is necessary to analyze the suitability of the utilization and carrying capacity of the area. Every activity that will be developed in each zone is directed at conservation-based management by considering the ecological, economic and socio-cultural links, so that ecologically the quality of resources can be sustained, while contributing to profitable income and can guarantee an increase in social welfare.

The research is an attempt to developed a model of utilization in conservation areas, to answer the fundamental problem whether the determination of each zone is carried out by considering the suitability criteria and how the suitability of the region and its carrying capacity for the development of various activities in its use. The study was conducted to evaluate the zone's fit criteria; analyzing land suitability and calculating the carrying capacity of utilization in each zone of the Gitanada Conservation Area. The results of the study are expected to be beneficial for the government in formulating policies on the management of conservation areas.

2. Methods

Time and Location

The study was conducted from May to September 2018 in the Conservation Areas of Gitanada, West Lombok.

Data Collection Method

Biophysical data collection is done by visual survey and direct measurement. Secondary data were collected from various relevant sources, selected in a structured manner from various related agencies. Mangrove physical data retrieval is done using the Transect square method based on differences in vegetation structure (Bengen, 2001). Seagrass data collection using Systematic Random Sampling method, while coral reef data collection using Line Transect Method to see the closure of coral lifeform.

Socio-economic data were collected by survey method through interview techniques assisted by a structured questionnaire. The sampling method is done by using a stratified random method / stratification, which is sampling from a population that has been divided into several groups, each group is done by a simple random method (Bengen, 2009).

3. Data analysis

Analysis of Zoning, Land Suitability and Carrying Capacity

Zoning criteria analysis uses parameters that have been modified based on conformity criteria according to IUCN, 1984. While the analysis of the suitability of use using the Geographic Information System (GIS). Carrying capacity, using the formulation:

$$DDL = LLS \times KL$$

Where:
DDL = Land Carrying Capacity,
LLS = Land Area Appropriate,
KL = Land Capacity

4. Results and Discussion

The analysis of the identification and existing conditions of coral reefs is quite good with a percent coverage of coral between 31-60%, the characteristics of the waters with a fairly long average reef (> 50 -100 meters). The seagrass ecosystems are considered unhealthy because the seagrass cover is in the range of 30-60%.

According to regulation of the minister of marine and fisheries of the Republic of Indonesia number 17 of 2008 concerning zones in water conservation areas which refers to a number of suitability criteria that are assessed based on the level of importance (weight) most needed for each zone. The results of the analysis and mapping of the results show that zones based on consideration of conformity criteria can be shown in the following figure:

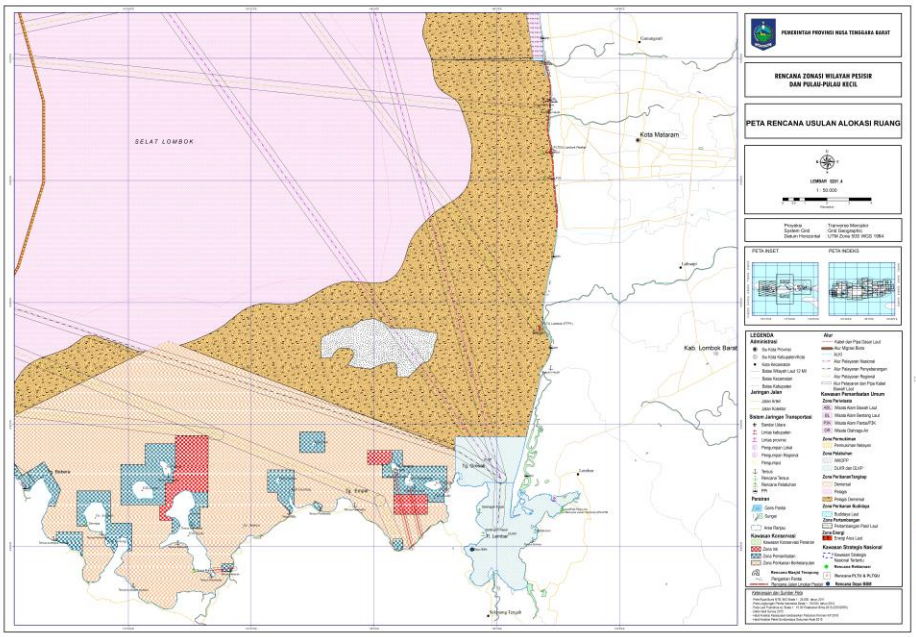

Figure 1. Zonation Map of Gitanada Conservation Area

Suitability for No Take Zones

The core zone for the protection of fish habitats and populations, as well as the migration paths of marine biota, protection of unique and / or vulnerable coastal ecosystems, protection of traditional cultural / traditional sites, research and / or education. The results of spatial analysis and mapping analysis, showed that the appropriate area for the core zone was 158.83 hectares, with a total score reached 18.7 or an average of 1.87 (the appropriate category).

Suitability of Establishment of Limited Use Zones

The limited use zone for the protection of ecosystem and population resources and the environment for a marine culture and tourism, research and development and education. The analysis show that appropriate are for this zone is 241,91 hectares with total score reached 17,4 an average of 1,74 (the appropriate category)

Other Zone Conformity Criteria.

It is a zone outside the core zone and a limited use zone because its functions and conditions are determined as certain zones, including rehabilitation zones, sustainable fishing

zones, and so on. Based on the results of the analysis it was found that the appropriate area for other zones was 2,119.92 hectares, with a total score reached 15.6 on average 1.56 (appropriate category).

Regions for Various Uses in Gitanada Conservation Areas.

Fishing

Based on the results of the analysis of the suitability of the area for coral fisheries obtained an area of 99.58 ha. This suitability condition is possible because the feasibility parameters at the location are very supportive for its development, such as water depth, water bottom topography, brightness, weather changes, coral reef conditions, pollution and abundance of target fish with a total score weighted 19.4 or 1.94 (very high category accordingly) in the range of scores 1-2.

Marine Culture

Marine culture that can be developed in accordance with the suitability of the region is shellfish and seaweed. Based on the analysis results obtained an area for shellfish cultivation covering 132.00 hectares with a production capacity of 1,056 tons per year and seaweed covering an area of 132.99 hectares with a production capacity of 1,063 tons per year. Parameters for shellfish culture such as protection, wave height, flow velocity, water bottom, water depth and salinity with a total weighted score of 24.5 or a mean of 2.45 (very appropriate) in the range of scores 1-3. While parameters for grass cultivation sea, such as protection, wave height, current velocity, water bottom, water depth and salinity with a total weighted score of 25.5 or average 2.55 (very appropriate) in the range of scores 1 - 3. The land suitability conditions are supported by the physical and chemical parameters of the waters in regions as shown in the following tables 1 and 2:

Table 1. Conformity Criteria for Mollusc Cultivation in the Gitanada Conservation Area

Water Quality Parameters	**Station**								
	1	2	3	4	5	6	7	8	average
Protection	protected	protected	protected	poorly protected	protected	protected	protected	poorly protectd	protected
Wave Height (m)	0.40	0.30	0.40	0.50	0.30	0.30	0.40	0.50	0.39
Water depth (m)	14,5	15.8	14.5	15.5	14.5	16	14.6	16	15.18
Stream Speed (m / sec)	0.13	0.10	0.09	0.12	0.15	0.18	0.09	0.12	0.12
Basic Water Material	Sand reefs	muddy	Complex	Complex	muddy	Sand reefs	Complex	Complex	Sand reefs
Salinity (o/oo)	28,80	29,20	29.50	29,70	28.90	27.80	26.70	27.90	28.53

Source: insitu and exsitu results, 2018

Table 2. Criteria for Suitability of Seaweeds in Gitanada Conservation Area

Water Quality Parameters	**Station**								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**average**
Protection	protected	protected	protected	poorly protected	protected	protected	protected	poorly protected	protected
Depth of water (m)	14,5	15.8	14.5	15.5	14.5	16	14.6	16	15.18
Basic Water Material	Sand reefs	muddy	complex	complex	muddy	Sand reefs	complex	complex	Sand reefs
Flow Speed (cm / sec	0.13	0.10	0.09	0.12	0.15	0.18	0.09	0.12	0.12
Brightness (meters)	14,4	17	7	4	5	10	14	5	9,55
Salinity (o / oo)	28,80	29,2	29.50	29,70	28.90	27.80	26.70	27.90	28.53
Temperature (°C)	30,0	30,2	30,4	29,9	30,1	29,7	29,6	30,3	30,03
DO (ppm)	7.23	7.19	7.22	6.71	6.96	6.82	7.19	7.55	7.11

Source: Insitu and exsitu results, 2018

Tourism

According to the Directorate of Directorate General of Marine Management of the Ministry of Marine and Fisheries of the Republic of Indonesia (2003) in the Space Planning Details Plan of Gitanada, the zones that can be used for recreational activities are limited utilization zones and other zones. Day trips are activities that harness the potential of natural resources and the surrounding waters for swimming, sunbathing, diving and snorkeling. The suitability of the waters for day trips is done by considering the suitability parameters (Bengen, 2002) such as water brightness, coral reef type (number of species), coral species (number of species), current velocity, depth of water and basic substrate of water. The analysis showed that the ideal depth for the submarine category is 158.83 hectares, the conditional category is 99.58 hectares. The results indicate that not all areas of Gitanada area are eligible to serve as a tourism destination especially for snorkling and or diving activities, this is due to limiting factors.

Beach Tourism

Beach tourism includes beachside activities such as enjoying the beauty of the beach, beach sports, sunbathing, picnicking, camping, and beach swimming. The various attractions of tourism that can be used as a valuable selling point in this area are the beauty of the sea and the mangrove forest resources and the variety of wildlife within it and the white sand of the limited area. The potential for beach tourism development has not been well managed, but the beach tourism potential is more focused on swimming, sunbathing and water sports activities. Based on the parameters of the suitability of the coastal area (Bengen 2002), the depth of water, the material of water, the speed of stream, the brightness of water, the distance from the beach, the closure of the beach (beach vegetation), and the distance from the pollutant source. The analysis results show that the ideal area for beach tourism is 1,212 hectares.

The travel and whiskey visits increased, however visitors who come to visit are relatively short-lived, with an average of one to three days to enjoy coral reefs and meadows. The tourist arrivals due to lack of promotions, transport facilities, hotel infrastructure and home stay are key variables in the tourism industry. From the institutional point of view, a working group was formed that specifically assisted the management of Gitanada by the name of Wach. The survey results show that in each of the months of July - September, the number of foreign visits reached 1218 people and outside of that month with an average visit of 79 people. Expenses for a stay at Rp. 600,000 per day

allocated to home stay owner Rp. 550.000, -, cash Central Village Rp. 25,000 and Rp. 25,000 for Gitanada conservation group.

Gitanada Area Support

Ecological support in this study is the maximum amount of activity that a conservation area can tolerate for a certain period of time without causing the degradation of natural resources. Given that Gitanada is a conservation area, so any activities undertaken are non-mass activity, and limited utilization space, so determining regional sustainability should consider aspects of environmental sustainable.

The Carrying Capacity of Fisheries

Appropriate of standard for coral production according to Yulianda et al. 2009 reaches about 10-30 tonnes / km² or World Bank predictions (l996) within 1 km² of healthy coral reefs can produce 12-50 tonnes of coral reefs per year (Ochieng et al, l997). the maximum production capacity of coral reefs in the Gitanada Conservation Area with an average coral cover of 55% and adaptability for coral fisheries at 99.58 ha is 99.58 - 298.74 tonnes per annum.

The Carrying Capacity of Seaweed

Based on the analysis of suitability of area area suitable for 265.98 ha of seaweed cultivation with 50% land area, 531 units of land area for 40 cultivation with 40 x 60 m long field method with area of 132,99 ha was obtained. Aggadireja et al. (2004), states that with a good preservation system for seaweed cultivation it can achieve production of 1000 - 1500 kg dry weight / ha / harvest or about 6-9 ton / ha /year. Thus, grass production in the Gitanada area can reach 797, 88 - 1,063.92 tonnes / year

The Carrying Capacity of Shellfish

The calculation of sustainability for the cultivation of clams with long line patterns is used with approaches such as seaweed cultivation calculations. Based on the map overlay results, obtained an area of 264,00 hectares, clams cultivation area with 50 percent, land acquisition support for 528 units of clams with a 40 x 60 m long line method with an area of 132 ha. Buntadir et al. (2007), states that with a good maintenance system a production of 3 – 4 tonnes/ha/ harvest or about 6 - 8 tonnes / ha / year can be achieved. Thus, the production of shellfish reaches a production of 792 - 1,056 tonnes / year.

Tourist Attraction Support

The results of the analysis and map overlays show that the ideal depth for the submarine is 258.41 hectares. Yulianda (2007) suggested that for diving travelers should consider the condition of the reef community, as the percent of coral cover reflects the condition and support of the reef. If the condition of the coral community is good, with a cover of 55 percent then the area of submerged coral reef area is 55 percent of the coral overlay area. Thus it has the capacity to accommodate 16,183 people /year.

Beach Tourism Support

Beach tourism includes all activities at the beach such as enjoying the beauty of the beach, beach sports, sun bathing, picnic, camping and beach swimming. Based on the parameters of the suitability of the coastal area (Bengen 2002) in Maanema 2003 namely, depth of water, groundwater material, current velocity, water brightness, distance from the

beach, closure of beach (beach vegetation), and distance from pollutant sources. The analysis shows that the area suitable for beach tourism is 1,212 hectares with the capacity to accommodate 484,800 people / year, including recreational categories such as water sports, and fishing and for mangrove tourism activities in Gili Tangkong. 41,630 hectares, Gili Sudak covers 69. 023 hectares, making it possible to accommodate 404,261 people / year for tourists.

The support beach area of Gitanada is 905,244 per year. Based on current utilization activities, it is known that ecotourism activities are still under ecological support and can still be increased in quantity. The support of the marine tourism is much smaller than the other three tourist activities, due to the limitations of appropriate coral reefs. Judging from the current utilization and the increasing number of visits each year, it is likely that the utilization of both day and beach tourism will be supported especially during peak season if supported by adequate infrastructure.

5. Conclusion

1. Appropriate marine cultivation activities developed in the limited utilization zone of the Gitanada conservation area are 132 hectares of mollusc with a production capacity of 1,056 tonnes per annum and seaweed cultivation of 132,99 hectares with production capacity of 1.063 tonnes per years.
2. An appropriate coral fishery to be developed in the 9,558 ha with a production capacity of 99.58 - 298.74 tonnes per annum. 401.74 ha coral reef resource based activities, for dive and snorkeling tours of 258.41 hectares and the rest for beach excursions.
3. The coastal tourism activities depelove in the 1212.35 hectare
4. Considering conservation of natural resources and environment and local community involvement in marine cultivation activities will be able to provide value for each of the beneficiaries of interest in Gitanada conservation area.
5. The management Conservation Area is intended to support ecological, economic and social sustainability.
6. This study can be used as a revised material for the Management Plan Document. Therefore to follow up of this research that the local government, has been one of the catalysts in formulating conservation area policy program from the socialization stage of every benefit element so that future management becomes more effective.

6. References

NTB Natural Resources Conservation Center, 2006. Report of the Flora Fauna Inventory Results in West Nusa Tenggara Conservation Area.

Bengen DG..2002. Developing a Concept of Power in Environmental Management of Small Islands. Office of the Ministry of the Environment and the Faculty of Fisheries and Maritime Institute of Bogor Agriculture.

Bengen DG. 2000. Synopsis of Sampling Techniques and Biophysical Data Analysis of Coastal Resources. PKSPL FPIK-IPB.

Bengen DG..2002. Developing a Concept of Power in Environmental Management of Small Islands. Office of the Ministry of the Environment and the Faculty of Fisheries and Maritime Institute of Bogor Agriculture.

Bengen, DG, 2002. Synopsis of the Coastal and Marine Natural Resources Ecosystem and its Management Principles. Coastal and Marine Resources Research Center (PKSPL) IPB Bogor.

Islands and Fisheries Research Center, 2004. Gili Sulat and Gili Lawang district West Coast Conservation Area Management Plan Document.

RI Department of Marine and Fisheries, 2001. General Guidelines for the Management of Sustainable and Community-Based Small Islands. Offshore Offshore Small Islands. Jakarta. 21 things

RI Department of Marine and Fisheries, 2002. General guidelines for coastal management planning. Department of Marine and Fisheries, Jakarta

Ministry of Environment and FPIK IPB. 2005. Final Report: Developing the Concept of Sustainable Power in Small Island Environmental Management. Bogor: The Ministry of the Environment cooperates with the Faculty of Fisheries and Marine Sciences.

Maanema, M. 2003. Small Island Utilization Models (Case Studies in the Thousand Islands Islands Islands). Doctoral dissertation of Graduate School of Bogor Agricultural Institute, Bogor.

Ochieng, C, A Phongsuwan, N & Erftemeijer P, L, A. l997. Assessment of the Current Status of Three Selected Coral Reefs in the Andaman Sea, Thailand. Wetlands International - Asia Pacific, Hat Yai, Publication No.1

Republic of Indonesia Law No. 5 of 1990 on Conservation of Biodiversity and its Ecosystem.

Republic of Indonesia Law No. 27 of 2007 Regarding the Management of Coastal Areas and Small Islands

Yulianda, F. 2007. The New Ecotourism Papers as an Alternative Use of Conservation-based Coastal Resources. Department of Science Resources Management FPIK-IPB Science Seminar, February 21, Bogor.