THE DIVERSITY AND DISTRIBUTION OF SEAGRASS IN KARANG TIRTA BEACH PADANG CITY, WEST SUMATERA

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ABSTRACT

Diversity and Distribution of Seagrass in Karang Tirta Beach Padang City, West Sumatera was conducted from April to June 2011. This study was intended to analyze the diversity, distribution pattern, coverage, composition and structure community of seagrass in Karang Tirta beach. Measurement of distribution aspect was analyzed with line transect method and sample of seagrass collected by using squares plot 0.5 x 0.5 m. Approximately 12 ha total of seagrass was estimated in various areas, such as: intertidal zone of tourism area, people settlement and mangrove zone. Seagrass distribution pattern was grouping category, and it was found 2 of 13 Species from Family Hidrocharitaceae of Indonesian seagrass exist, they were *Thalassia hemprichii* about 1.59 and *Enhalus acoroides* about 9.95. They were included into poor seagrass category with coverage ranged between 21.11% for *T. hemprichii* and 5.66% for *E. acoroides*. The highest species density was *T. hemprichii* (309.2 ind/m^2) with appearance frequency value 100% and important value 252. The lowest species density was *E. acoroides* (7.73 ind/m^2) with appearance frequency value 33.33% and important value 48.

Keywords: Diversity, Distribution, Seagrass, Ecology, Coverage.

Introduction

Seagrass is a plant that have the vascular structure and function are the same as plants on land. Seagrass is a plant that all part of it are include: fruit, flower, leaf and roots are growing on the substrate muddy, sand and rock that live submerged in seawater. The presence of seagrass in the marine contained about adjacent tidal areas (intertidal and subtidal) up to a certain depth where sun light can still reach the sea floor (Mann, 2000).

The main function of seagrass ecosystems can provide nutrients to the surrounding waters biota residing. Seagrass ecosystem is a primary produce in the food chain in marine waters with primary productivity ranged from900-4650gC/m^2/year. Growth, morphology, abundance and primary productivity of seagrass in an aquatic are generally determined by the availability of nutrients phosphate, nitrate anda mmonium (Green andShort, 2003). Since 1980until2008, estimated seagrass in the world has been degraded by 54% (Bjork, et al, 2008).

Karang Tirta Beach is located in District Lubuk Begalung Padang, has a long coastline ± 3 km. On coastal slopes and broad enough in Kota Padang was found seagrass meadows. Generally, this area is a coastal tourist sites and run a traditional fishing boat harbor. The activities of these, either directly or indirectly impact on the balance and sustainability of seagrass ecosystems in the coastal areas. Reviewing some aspects of the ecology of seagrass communities, such as Scatter Pattern, Percent covering, composition and structure community of seagrass and its associated biota will be very helpful in providing information and monitoring the presence of seagrass ecosystem sustainability in the future (Supriyadi, 2010).

Material and Method

This study was conducted from April - June2011 in Karang Tirta Beach, Padang. This extended in Laboratory Water Environment, Environment Engineering Department, Faculty of Engineering, Andalas University, Padang. Among other tools used Google EarthMaprecordsin 2011, the square0,5x0,5m. Swimming mask, fin, and snorkel, GPS, thermometer, handsalinorefractometer, indicator pH Universal, underwater camera, spectrophotometer, computer, WhatmanfilterpaperNo.42, bottles 1liter, and oven. While the material used is a solution ofbrucine2%, $H2SO_4$concentratedsolution ofBaCl2-tween.

Acquisition of data distribution pattern, composition and type of seagrass cover is done by line transect method, with data acquisition using the square0,5x0,5m. Mapping the spread of seagrass survey conducted by in-situ method using GPS (Global Posisitioning System). Survey results were analyzedwith GIS(Geographic Information System) usingArcView3.3program.

Results and Discussion

Karang Tirta Beachorbetter knownby the community asNirwanaBeachis acoastalstretchhas manyenvironmentalzoning. From the results ofGISanalysisKarangTirtacoasthavelongcoastline±3km. This area isdivided intothreezonesrangingfromresidentialzoneresidents(± 1200 m), tourist zone(± 800m) and themangrovezone(± 1000 m). CoralCoastofGIS analysishaspredictedKarang Tirtaarea±65.86ha. The area has aregionalgroupingbiotaspreadprettyobvious.The area isdominatedbyseagrass, seaweed, mangroveandcoral. Reefsinthis areaareatthe limitsof the oceanorseabluff, itfollowedbythe biota ofsea grass andapproached thecoastlineis generallycoveredbyseagrass.

Visuallyin theresidentialzonewatersmurkyand dirty, blacksandsubstrate, butstilllightpenetrationtothebottom waters. Formedblacksandis thought tobe causedby the inputof household wasteandorganicmaterialfromsmall riversin the surrounding areas. Waters closeto population centersBarameh's riveris widely usedasamooringboatof various sizesbythe surrounding community. Most of theboatis afishingboat, butthere arealsoleasedfor tourismpopulationtocross the seato the Kasiak Island.

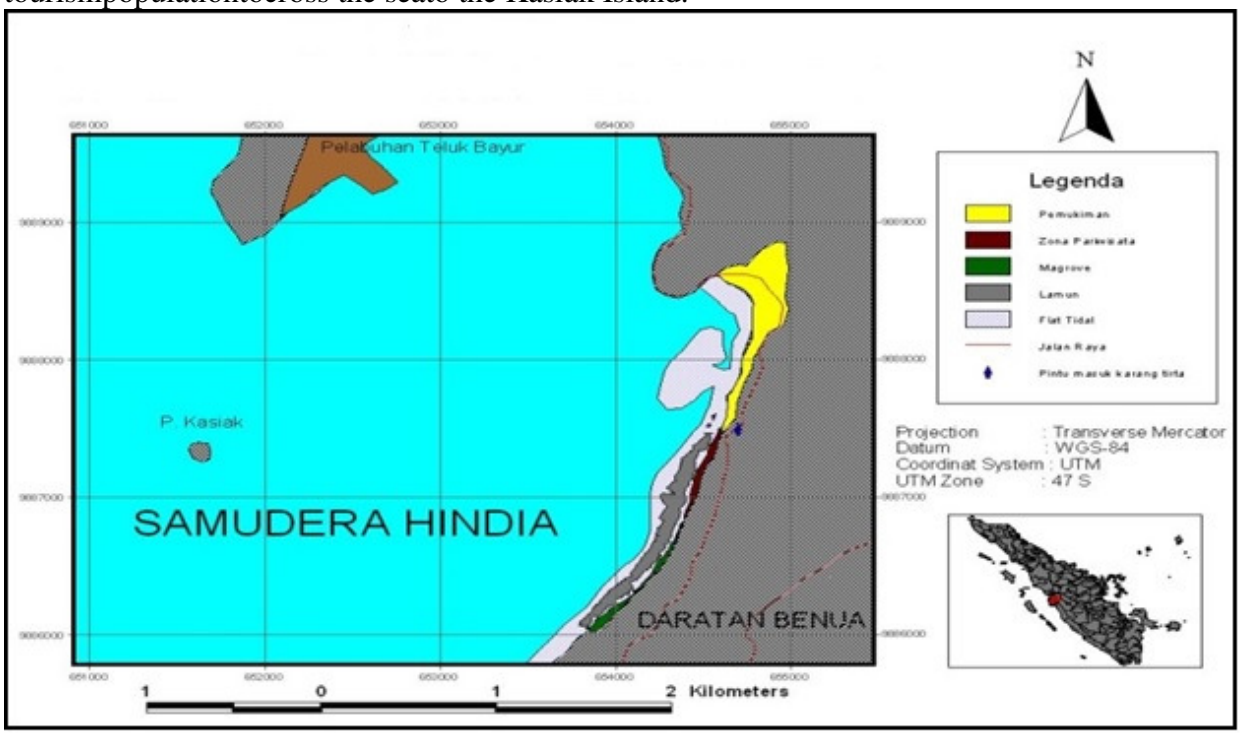

Figure 1. Zonation Map Karang Tirta Beach

Inthis zoneare foundtrash(bottles, andplasticfoodwrap). Environmental conditionswereverydirtywaterinthis areadoes notmakea lot ofseagrassfound, butina residentialzonethat is closeto thedirection ofthe tourismzonebegan toreveal anyseagrassthe numberandcoververylittle. Tourismzoneis an areathat has beencovered withseagrass. It has awatersubstrateconsisting ofsand, rubble, dead's coralandlives' coral. This area isused by manytourists forswimmingandfishing. The conditionis not socleanwaters, becausethecoastal dunesare stillfoundgarbage strewn.

Mangrovezoneis an area thathaswaterthat isclean. Fewfound anywasteinthisarea. This area isoftenbypassedby tourists, usuallyvisited byseveralpeople tofishing. Mangroveforestsarefound inthis regionis dominated by*Rhizophora*sp. Substrateinthese zoneissand, mudandstoneas well asa mixbetweenthesubstrates. Seagrassecosystemisan ecosystemthatcanprovidea source offoodandnutrients for theorganisms. Healthyseagrassecosystemscanprovide a placeto live, spawningandrearingchildrenforotherorganisms. The presence ofassociatedbiotainseagrassecosystemscanprovide an assessment oftheecosystemhealth(Bjork at all, 1999). Of the threezones arealsofoundsomeother organismsthat livein associationwithseagrass, someorganismswerefound ineach ofthesezonesis shown in Table1.

Table 1. Other Biota in Seagrass Meadows Karang Tirta Beach

No	Biota	Station I	Station II	Station III
1	*Padina* sp. (seawed)	√	√	√
2	Pisces (fish)	√	√	√
3	Molusca (clam)	X	√	√
4	Crustacea (crabs)	X	√	√
5	*Spongia* sp. (spons)	√	√	√
6	*Holothuridea* (sea urchin)	√	√	√

Where, √ = found and X = not found

Table 2. Physical-Chemical quality in Karang Tirta Beach

Parameter	Stasiun I	Stasiun II	Stasiun III
Water Temperature (^{0}C)	33	32	33
Salinity (‰)	32	34	33
pH	7	7	7
Depth (cm)	8-34	13-57	18-58
TSS (mg/l)	12	10	12
Nitrat (mg/l)	0.050	0.048	0.042
Phosphate (mg/l)	0.035	0.045	0.050
Substrat	Sand and Rock	Sand and Rock	Sand, Rock and Muddy

Physical-chemicalconditions ofquality the wateris one ofthe decisive factors forthe growthandsurvival ofseagrass. Growth, morphology, abundanceandprimaryproductivityof seagrassinanaquatic are generally determinedbythe availability ofnutrientsphosphate, nitrateandammonium(Green andShort, 2003). The results ofmeasurements ofPhysical-Chemical factorsinshoreKarangTirtacan be seenin Table2.

Seagrassin the coastal waters Karang Tirta scatteredat coordinates 1^0 01.009 S and 100^0 23.345 E until 1^0 01.841 E and 100^0 22.952 E with broad distribution area ±12ha. The distribution is found in intertidal areas in residential zones,

tourismzonesandmangrovezoneswithdistributionpatternofeachspeciesincludingclusteredcategories, the species is *Thalassiahemprichii*(1.59) and *Enhalusacoroides*(9.95).

The spread ofseagrassontidalflatsis atmidway betweentheedges ofthe shore. This zoneis theintertidal zone, whereasthesubtidalzonedominatedby*Turbinaria*sp. and*Sargasum*sp. ("Seaweed"). With themorphologyandcharacteristics ofshallowwatersand has experiencedthe pressureof human activities. In Karang Tirta Beach wasfoundtwospecies ofseagrass, they are *Thalassia hemprichii*and*Enhalusacoroides*. Thisspeciesis a speciesthat isoften foundin Indonesian. Previous studies inseveralregionsinIndonesia suchwatersin theGulf watersRiauBintanisland, LembehBitungNorth Sulawesi, EastKalimantanwatersDerawan, Toli-Toli BayNorth Sulawesi, also foundon theseagrass*Thalassiahemprichii*and*Enhalusacoroides*. Of the 13speciesof seagrassfoundinIndonesiais onlytwo species ofexistencefoundinthe Karang Tirta Beach.

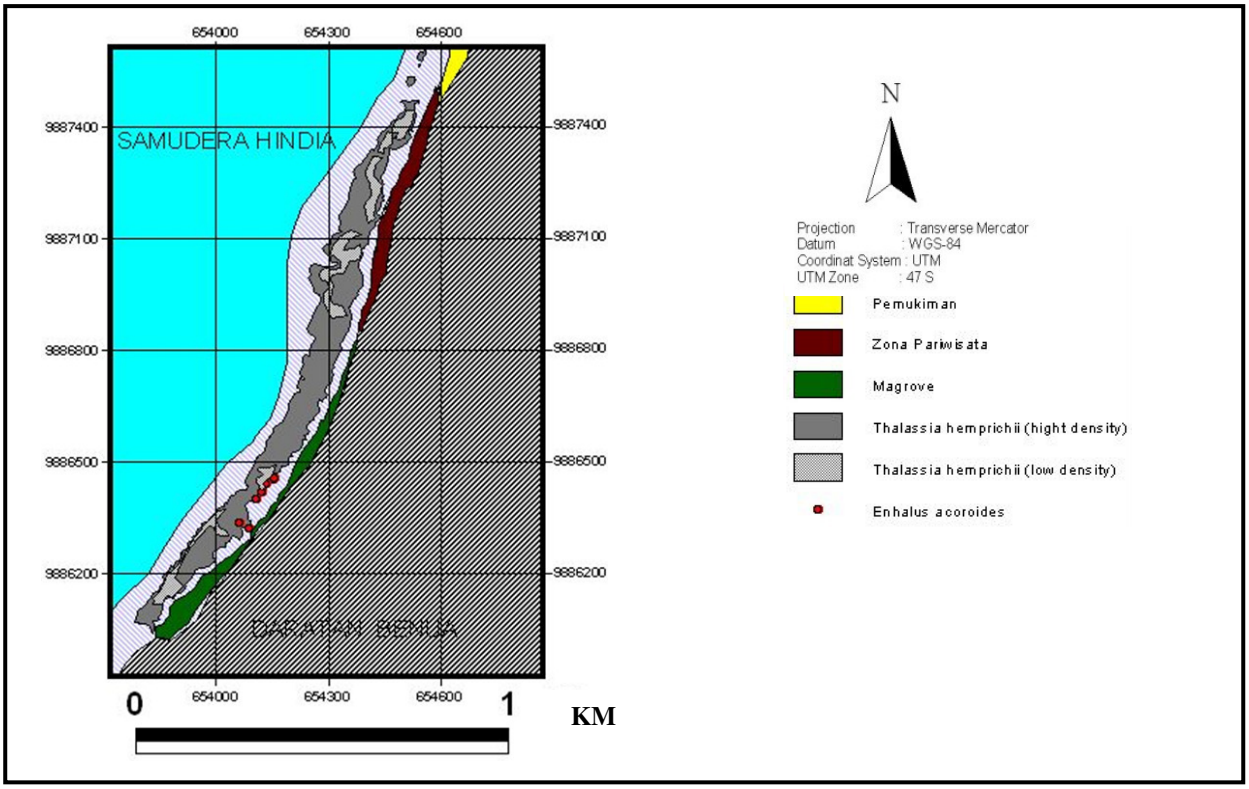

Figure 2. Seagrass Distribution in Karang Tirta Beach

Seagrassconditionsin Karang Tirta Beachincluded in thepoorcategorywithan averagecoverpercentageof26.77%. The percentageof *Thalassiahemprichii* was 21.11% and*Enhalusacoroides* was 5.66%. The highest density is found in *Thalassiahemprichii*(309.20 ind/m^2) with afrequency of100% AttendanceandImportantValueType252.Lowestdensityis found*Enhalusacoroides*(7.73ind/m^2) with afrequency of33.33% and thepresence ofImportantValue48.

Seagrassin Karang Tirta beachshowedthe importance ofeachdifferenttype.The importance value of*Thalassiahemprichii*is252, whereasonlyamounted48 for *Enhalusacoroides*. This conditionshows theimportance valueof*Thalassiahemprichii*greater than*Enhalusacoroides*. Importantmagnitudevalueof*Thalassiahemprichii*this specieshas greaterlarger roleinseagrasscommunitiesinthe Karang Tirta beachthan*Enhalusacoroides*. According toOdum(1971), the higher theimportance value indexof akindto other strainswithina community, the higherthetype ofrolein the community.

In general it canbe analyzedat leastcover*Enhalusacoroides*awaterdepthmismatchforgrowth. The natureof lifeiscompletelysubmergedseagrassinthewateris a limiting factorfor*Enhalusacoroides* growth. *Enhalus acoroides* leavescan reach about 1m(Kannan andThangaradjou, 1999), intertidal zoneat a depth ofKarang Tirta only ranged from8-58cm(Table 2), because of that makesthis speciescannot able toliveonthis area. This isalsoevidencedby the discoveryofthis species offractureleavesdecayingdue tosunburn, this is because thetidewas too lowto makethe leaves*Enhalusacoroides*no longer fullysubmergedinwater.

Conclusions

Seagrassdistributionarea on Karang Tirta beach is±12ha, spreadtheintertidalareaina residentialzone, tourismzoneandmangrovezonewiththeirdispersalpatternsof speciesincludingclusteredcategories, They are *Thalassiahemprichii*(1.59) and*Enhalusacoroides*of(9,95).Condition of Seagrass in Karang Tirta Beach isclassified as poorbythe percentagecoveran average of26.77%. Seagrassin Karang Tirta was found two species they are is*Thalassia hemprichii*and*Enhalusacoroides*, fallinginto thefamilyHidrocharitaceae. The highestdensityis*Thalassiahemprichii*(309.20 ind/m^2) with afrequency of100% attendanceandImportantValues252.DensityofEnhalusacoroides is 7.73 ind/m^2) withfrequency ofattendance of33.33% and48ImportantValues.

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