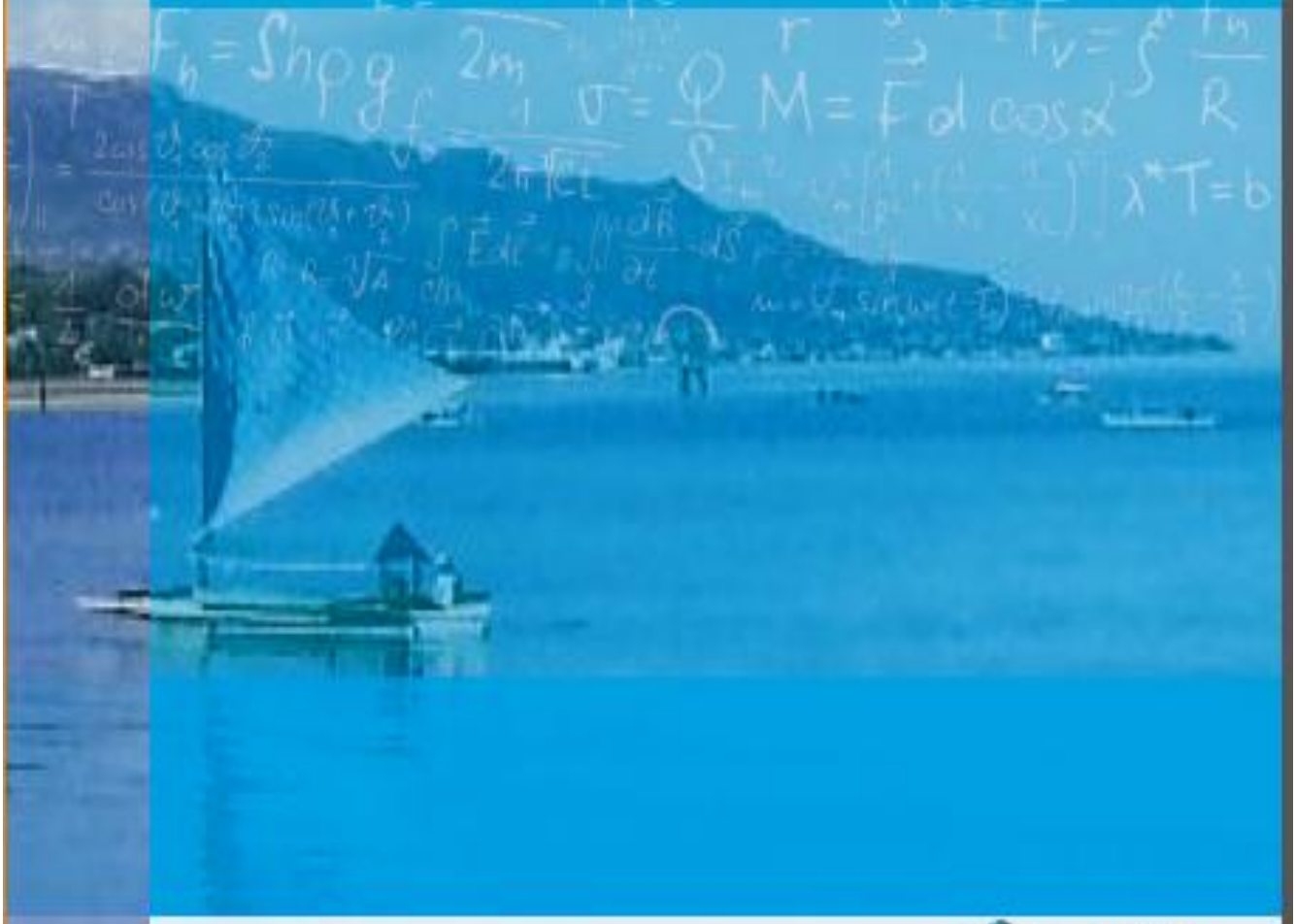
Basic Science
for Sustainable Marine Development

PROCEEDING
INTERNATIONAL SEMINAR 2015

Ambon, 3-4 June 2015



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Faculty of Mathematics and Natural Sciences
Pattimura University

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1st International Seminar of Basic Science, FMIPA Unpatti - Ambon
June, 3rd – 4th 2015

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Welcoming Address by The Organizing Committee

The honorable, the rector of Pattimura University

The honorable, the vice rector of academic affair, Pattimura University

The honorable, the vice rector of administration and financial affair, Pattimura University

The honorable, the vice rector of planning, cooperation and information affair, Pattimura University

The honorable, all the deans in Pattimura University

The honorable, the key note speakers and other guests.

We have to thank The Almighty God for the blessings that allow this International seminar can be held today. This is the first seminar about MIPA Science in which the Faculty of MIPA Pattimura University becomes the host. The seminar under the title Basic Science for Sustainable Marine Development will be carried out on 3 June 2015 at Rectorate Building, the second floor. There are 250 participants from lecturers, research institute, students, and also there are 34 papers will be presented.

This International seminar is supported by the amazing people who always give financial as well as moral supports. My special thanks refer to the rector of Pattimura University, Prof. Dr. Thomas Pentury, M.Si, and the Dean of MIPA Faculty, Prof. Dr. Pieter Kakissina, M. Si. I also would like to express my deepest gratitude to Dr. Kotaro Ichikawa, the director of CSEAS Kyoto University, Prof. Bohari M. Yamin, University of Kebangsaan Malaysia, Prof. Dr. Budi Nurani Ruchjana (Prisident of Indonesian Mathematical Society/Indo-MS), Dr. Ir. A. Syailatua, M.Sc (Director of LIPI Ambon), and Hendry Ishak Elim, PhD as the key note speakers. We expect that this international seminar can give valuable information and contribution especially in developing basic science for sustainable marine development in the future.

Last but not least, we realize that as human we have weaknesses in holding this seminar, but personally I believe that there are pearls behind this seminar. Thank you very much.

Chairman

Dr. Netty Siahaya, M.Si.

Opening Remarks
By Dean of Mathematic and Natural Science Faculty

I express my deepest gratitude to The Almighty God for every single blessing He provides us especially in the process of holding the seminar until publishing the proceeding of International Seminar in celebrating the 17th anniversary of MIPA Faculty, Pattimura University. The theme of the anniversary is under the title Basic Science for Sustainable Marine Development. The reason of choosing this theme is that Maluku is one of five areas in Techno Park Marine in Indonesia. Furthermore, it is expected that this development can be means where the process of innovation, it is the conversion of science and technology into economic value can be worthwhile for public welfare especially coastal communities.

Having the second big variety of biological resources in the world, Indonesia is rich of its marine flora and fauna. These potential resources can be treated as high value products that demand by international market. Basic science of MIPA plays important role in developing the management of sustainable marine biological resources.

The scientific articles in this proceeding are the results of research and they are analyzed scientifically. It is expected that this proceeding can be valuable information in terms of developing science and technology for public welfare, especially people in Maluku.

My special thanks refer to all researchers and reviewers for your brilliant ideas in completing and publishing this proceeding. I also would like to express my gratefulness to the dies committee-anniversary of MIPA Faculty for your creativity and hard working in finishing this proceeding, God Bless you all.

Dean of Mathematic and Natural Science Faculty

Prof. Dr. Pieter Kakisina, M.Si.

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Sustainability Analysis Management Coral Reef Ecosystem In The Water Of The Bay Of Ambon

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Abstract

This research was conducted in order to be able to see the effect of how the multi-dimensional analysis of the sustainability of coral reef resource management in the coastal region of Ambon city. Results of the study a portrait that is based on multi-dimensional analysis turned out to influence the ecological dimension has great value sustainability index that is 57.90% with the status of *quite sustainable*, the next Economic Dimension 54.47% with a status *quite sustainable*. For socio-cultural dimensions of 48.32% with *less sustainable status.* There are 9 very sensitive attributes that affect the sustainability of the status of coral reefs in the coastal area of the city of Ambon. The results also showed that the multi-dimensional management of coral reefs coastal area of Ambon city can be quite sustainable with the multi-dimensional sustainability index amounted to 54.50%. Through analysis of Multi-Dimensional (MDS) and Monte Carlo analysis can show the influence of the error with an error rate at the level of 95 percent with stress values ranging between 13% - 15%, the value of determination (R2) ranges from 0.94 to 0.96 (more less than 1.0). It can be concluded that the analysis by Rap-COSTALAMBON can be used to evaluate the level of sustainability of coral reefs in the coastal area of the city of Ambon.

***Keywords**; Analysis of sustainability, the coastal city of Ambon, coral reefs1.*

1. Background

Coastal ecosystems is a unique ecosystem because it is a region of transition between terrestrial ecosystems (terrestrial) and marine ecosystems (oceanic). The influence of both the ecosystem is forming a new unique characteristics, different from both the ecosystem that influence it. Tropical coastal ecosystems usually consists of several supporting ecosystems within it are interrelated. These ecosystems are coral reefs, mangroves and seagrass. Coral reef ecosystems occupy the forefront, followed by seagrass and mangrove ecosystems. Coral reef ecosystems has specific characteristics and is highly dependent on the condition of the surrounding waters.

Coral diversity coined a huge potential both economically and ecologically. Coral reef ecosystems inhabited by diverse biota both marine animals and plants. Diversity of coral reefs with colors of different types of coral are interesting objects that can be used as a tourist area. Coral reefs are habitat for many species of fish and coral plants. Ecological role played by reefs. Coral is a regional provider of food, care areas, areas of growth and areas for the protection of biota associated with coral reefs. As the capital of the province of Maluku, Ambon has grown into a city of services and commercial and government

activities as well as having a strategic role both nationally and regionally. Nationally Ambon city has a function as the National Service Center (PKN) as defined in Regulation No. 26 of 2008 on the National Spatial Plan (RTRWN) .On the other hand, Ambon also serves as a good fishery production center for regional services scale national / international, supported by the existence of Fishery Port Nusantara (VAT), which all centered activities in the Bay Area city of Ambon. Increased activity that occurred in the Gulf region Ambon, will increase the need for land, resulting in land use conflicts between the various development actors in Ambon Bay Area.

This causes irregularity land use, so it has implications for water quality and coastal ecosystems such as coral reefs, mangroves, and seagrasses. Coastal ecosystem plays an important role in maintaining environmental balance, namely (1) as coastal protection against waves, wind storms and tides; (2) as a producer of large amounts of detritus; (3) as a regional care (nursery grounds), the area in search of food (feeding ground) and spawning (spawning ground) various marine organisms (fish, shrimp and shellfish) both living in coastal waters and offshore; (4) as a binding sediment and stabilize the soft substrate; and (5) as the reserves of natural resources (natural stock) for various types of biota that important economic value. Therefore, in developing spatial planning of coastal areas should take into account the status of coastal ecosystems, in order to be realized balance between land use with the preservation of the ecosystem.

Damage to coastal ecosystems must be observed and the in-depth diperhati. Because of the damage to coastal ecosystems is always followed by environmental issues, including the occurrence of coastal erosion, flooding, sedimentation, reduced productivity of fisheries, to the loss of some small islands. The stability of coastal ecosystems, coastal and land is something that is rarely noticed by almost all stakeholderyang involved in the utilization of the coastal ecosystem. So that damage to coastal ecosystems considered to be a natural thing as the impacts that will occur as a result of management activities. Many stakeholders who tend to be reluctant to repair and rehabilitate coastal ecosystems being exploited to meet their needs. Something very naive that affected coastal ecosystems, which in turn lead to degradation of coastal ecosystem.

Based on secondary data and research results from the Faculty of Fisheries Unpatti for approximately 5-10 last year to 149 locations in Maluku province turned out to be concluded as many as 49.6 percent of coral reefs were damaged, " Yulia research results Asyiawati et al, 2008, with an index based on the value of coastal ecosystems found that the status of coastal ecosystems Ambon Bay Area including the criteria for index coastal ecosystems damaged by 44.44%. Changes in the condition of coastal ecosystems caused by changes in land use on land, where there is a deviation of the spatial planning of land use Ambon City (2006 -2016). Deviations land use are quite significant influence on the condition of coral reefs is the conversion of forest land and agricultural land into residential areas (areas awakened). Based on the results obtained that the overlay conducted agricultural irregularities into developed regions is 95.40% resulting in increased sedimentation and a decrease of DO in the water, so the water turbidity levels to rise and will interfere with the growth of coral reefs. Damage also occurred because people use methods fishing that is not environmentally friendly such as blast fishing. Results of the study also concluded that the coral reefs in the island of Ambon also degraded very large.

On the island of Ambon there are reefs that have lost ground covered with sediment for example in the area of Pandan Kasturi, Java City-Village Rumahtiga and in the Halong area. This is due to the opening up of land area for residential causing sedimentation by

flooding to coastal areas resulted coral reefs with sand. Another cause also the existence of an excessive percentage of reclamation cause terumbuh kerusaakan coral. The existence of damaged coral reefs are also located in the Hamlet area Eri, Nusaniwe village, has also been approached damaged. Efforts by the local governments and municipalities to cope with damage to coral reefs continue to perform various coral reef conservation program in betuk transplantation / graft and build an artificial coral reef ecosystems. In addition kongrit steps undertaken to safeguard the environment and do not litter. To be able to solve all the problems of damage to coral reefs as mentioned above, and see how the influence and role of various sectors / fields in an attempt to answer the sustainability of coastal zone management in the city of Ambon, it is necessary to study a form of space utilization coastal and marine areas of integrated sustainable dimension of ecological, economic, technological, social, cultural and legal and institutional. Thus it is necessary to komperhensip a study of how the influence of multi-sector / field to sustainably manage coral reefs in the coastal area of the city of Ambon. So this research is very important to conduct an analysis of the sustainability of coral reef resource management in the city of Ambon in multi-dimensional as a reference for all the sectors concerned coastal region of the city of Ambon

2. Research methodology

2.1 Place and Time Research

Research locations include the Gulf Region Ambon City consists of TAD and TAL. Administratively the study area consists of four sub-district Nusaniwe the District, District Sirimau, Teluk Ambon, and Teluk Ambon Baguala consisting of 33 District / Village with an area of 19,900 ha to 8860.02 ha of water area. This research is generally focused on the location of coastal waters contained coral reef resources by not rule out other coastal ecosystems in the bay of Ambon in Ambon Bay and beyond.

This research. The appropriate time to be implemented for 8 months in September 2014 - April 2015

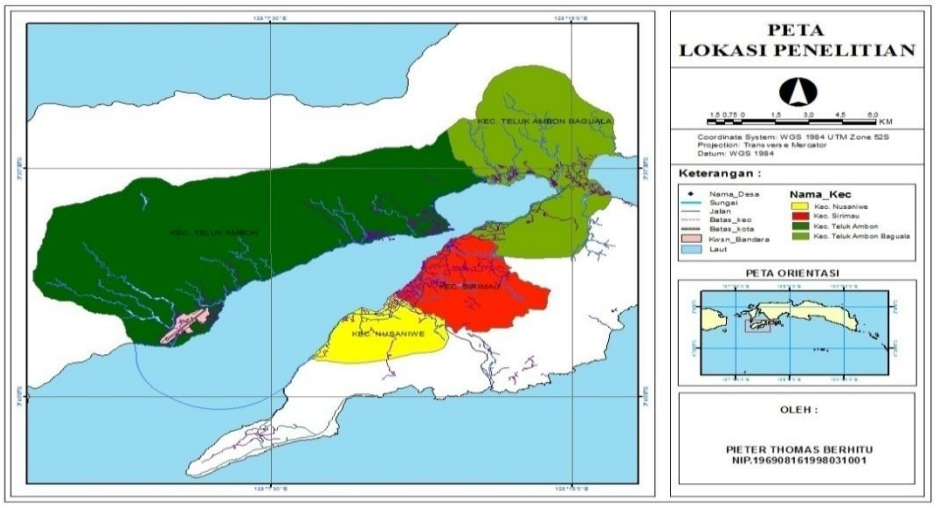

Figure 1. Location of Coastal Zone Research Ambon

2.2 Types and Sources of Data

This study was conducted using data sources primary data and secondary data. Secondary data were obtained through the study of literature and documents from various agencies related to both municipalities, provincial governments and civil society organizations, community related to this research. According to primary data obtained through interviews sustainability analysis via a questionnaire with experts that is highly correlated significantly with this study. Experts selected intentionally (purposive) by considering some of the following;

1. Having the appropriate fields of expertise and competency assessed;
2. Has the position, reputation based position within its competence to the field studied and has shown its credibility as an expert or experts in the field of study;
3. Having a commitment to the issues that were examined;
4. Characteristically neutral and willing to accept the opinion of other respondents; and
5. It has a high credibility and is willing consulted and are in the study area

3. Methods of Analysis

The method used for the analysis of sustainability appropriate this research is the analysis of multi-dimensional or Multi Dimension scaling (MDS) approach Rap-COASTALAMBON (Rapid Apprisal Coastal Zone Ambon City), MDS is an analysis technique which is transforming multi-dimensional (kavanah 2001 Fausi and Anna 2002). The results are expressed in the sustainability index coastal area management Ambon city.

Sustainability analysis carried out by several phases, among others; (1) determination of the attributes in an integrated and sustainable area of the coastal city of Ambon, which includes five dimensions of ecological, economic, social, cultural, infrastructure and technology as well as legal and institutional. (2) an assessment carried out by the attributes of ordinal scale based on sustainability criteria for each dimension (3). compile the index and the sustainability status of coastal area management Ambon city lies anatara sustainability index scale 0-100 (Table 1). (4). a sensitivity analysis to determine the attributes that are sensitive affects sustainability and (5) Montecarlo analysis to estimate the effect of the error at 95% confidence interval. After the prepared scenario strtegi forward with prospective analysis which aims to predict what might happen in the future after repair -Fixes against influential attributes. (Bohari et all 2008)

The score of each attribute multidimensional analyzed to determine one or several points that reflect the sustainability of coastal zone management positions are assessed relative to two reference points, namely point (good) and bad points (bad). On this analysis, the data in the form of three-dimensional attributes keberlanjutn coastal management that the economic, ecological, social and cultural, which is obtained by interviews and questionnaires. Sustainability analysis is done using a software level which is the development of methods Rapfish used to assess the status of sustainability with modifiikasi into Rap-COASTALAMBON (Coastal Area Rapid Appraisal Ambon city). Analysis of sustainability, expressed in the coastal zone management Sustainability Index Ambon city-based method of multidimensional scaling (MDS) to determine the level of sustainability and the factors that affect the sustainability of the management levers. Output of the sustainability index and leverage factor obtained becomes an input for the preparation of the AHP hierarchy diagram to formulate policy and management scenarios. Categories sustainability status based on analysis results MDS index values as the table below;

Table 1. Value indices of sustainability status of coastal zone management

indeks Value	catagory
0 .00 – 25.00	bad ((unsustainable)
25.01 – 50.00	less (less sustainable)
50.01 – 75.00	Quite (quite sustainable)
75.01 – 100.00	Good (highly sustainable)

Sourcer : Bourgeois and Jesus .2004 dan Hartisari, 2006

Through the method of MDS, the position of the point of sustainability can be visualized by the horizontal axis and vertical axis. With the process of rotation, then the position of the point can be visualized on the horizontal axis with the value of sustainability index rated a score of 0% (bad) and 100% (good). If the system has assessed the sustainability index value greater than or equal to 50% (> 50%), then the system is said (sustainable) and unsustainable if the index value is less than 50% (<50%). determination of stress, and the coefficient of determination (R2) which is a program of the package with the MDS program. Where the analysis results are considered accurate and reliable if the stress value of no more than 0.25 or 25 percent. Determination of sensitive attributes is done in order of priority on leverage analysis results to see the shape change of the root mean square (RMS). The greater the change in RMS value, the greater the role of these attributes in improving the status of sustainability, or in other words, the more sensitive these attributes in sustainability management of the coastal city of Ambon.

4. Result And Discussion

4.1. Economic Dimensions of Sustainability Status

The economic dimension is composed of nine attributes considered influence the sustainability status of coral reef resource management namely; (1) dependence on the fisheries sector (2) tourism employment (3) arrest effort based on the intensity of fishing activities (4) Base on income level fishermen proverty line number (5) Marketing of fishery (6) Visits Travelers Visit (7) Number of Attractions (8) Level damage to coastal and marine ecosystems (9) availability of capital base on the availability of capital fishermen. 9 attributes of sustainability on the economic dimension of analysis using software modification Rapfish namely Rap -COASTALAMBON (Rapid Appraisal coastal area Ambon city).

Based on the analysis by using RAP COASTALAMBON with 9 attributes that affect the status of the sustainability of ecological dimensions of sustainability index values obtained ecological dimensions of 54.47% with a status that is quite sustainable sustainability. Lavarage analysis results obtained by three attributes that are very sensitive influence on the sustainability index of the ecological dimensions; (1). Marketing of fishery (2). Base on income level fishermen proverty line number (3). arrest effort based on the intensity of fishing activities (see Figure 2.b yellow bar graph)

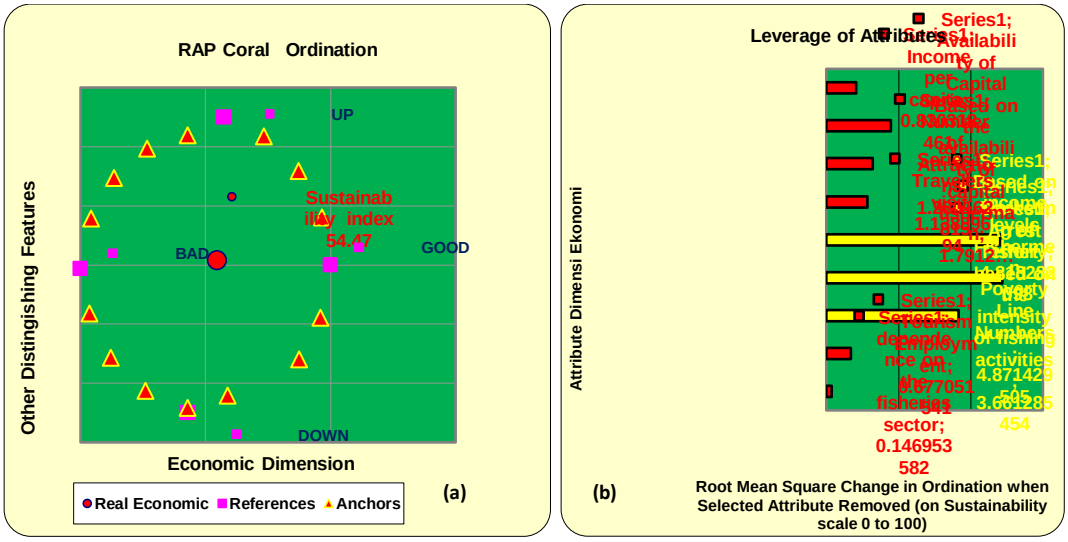

Figure 2 (a, b). Status and sustainability index and sensitive attribute affects the dimension of Economy

The emergence of the three attributes - attributes sensitive highly influential and necessary in the intervention of the sustainability dimension of ecology as above, should be given serious attention and managed well thus increasing the value of the index of sustainability dimension of Economy for the time and the foreseeable future it is very important in the effort to manage resources coral reefs in a sustainable manner. The attribute management efforts in a way to increase the role of each of the attributes that have a positive impact on the sustainability index and suppress any attributes that affect negatively to the economic dimension of sustainability indexes. So as to increase the value of the economic dimension of sustainability indexes.

4.2. Ecological Dimension of Sustainability Status

Ecological dimension consists of nine attributes considered influence the sustainability status of coastal zone management namely Ambon city; (1) coral prercentage Closure size (2) reef fish diversity (3) Supstrat water (4) the species has protected (5) sedimentation level (6) waters condition (7) total area protected (8) coral reef rehabilitation (9) exploitation level of reef fish. the analysis results using RAP COASTALAMBON with 9 attributes that affect the status of the sustainability of ecological dimensions of sustainability index values obtained ecological dimensions of 57.90% with a status that is ***quite sustainable*** sustainability. Lavarage analysis results obtained by three attributes that are very sensitive influence on the sustainability index of the ecological dimensions, namely; (1). the species has protected (2). water conditions (3). Total area protected. (see Figure 2b purple graph)

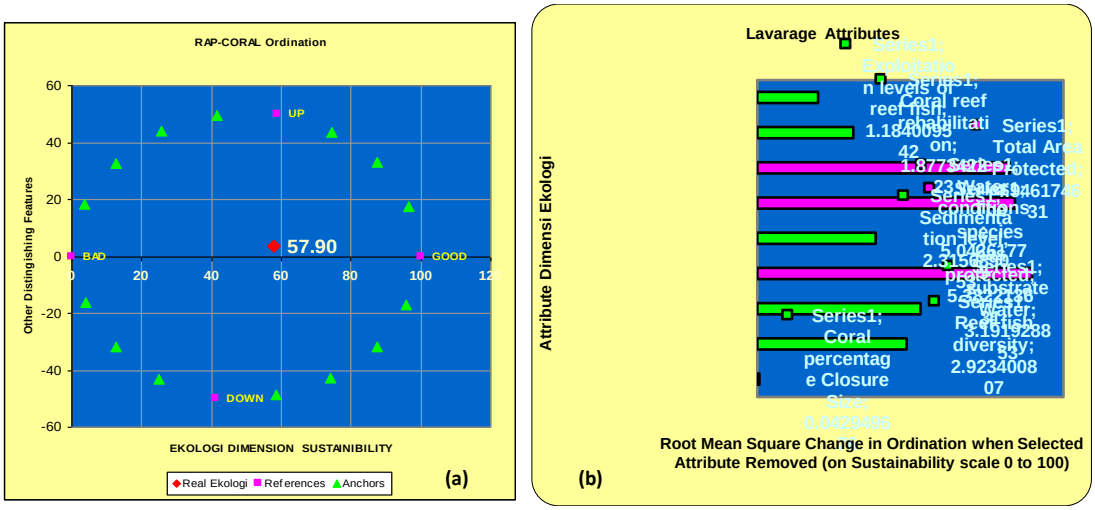

Figure 2 (a, b). Status and sustainability index and sensitive attributes affect the dimensions of Ecology

4.3. Social and Cultural Dimensions of Sustainability Status.

Social Dimensions of Culture consists of nine attributes considered influence the sustainability status of coral reef resource management in the coastal city of Ambon; (1) level of education of the population (2) Environment knowladge of fish and ecosystem (3). Potential conflicts with other sector (4) have aesthetic value (5) community empowement (6) rate of growth in the number of fishermen (7) alternative livehoods (8) compactness fishermen (9) the number of household fisheries

MDS analysis results for the nine attributes of sustainability to the social dimension of culture is done by using -COASTALAMBON Rap (Rapid Appraisal coastal area Ambon city) sustainability index values obtained Social dimension of culture **48,32 % .**

Based on the classification of the condition or status of the sustainability of the social dimension of culture is included in the category of less sustainable. Lavarege analysis results showed that there are five attributes that are very sensitive effect on the value of social and cultural dimensions of sustainability indices, namely; (1) rate of growth in the number of fishermen (2) Potential conflicts with other sector (3) Environment knowladge of fish and ecosystem (see Figure 3b red bar graph)

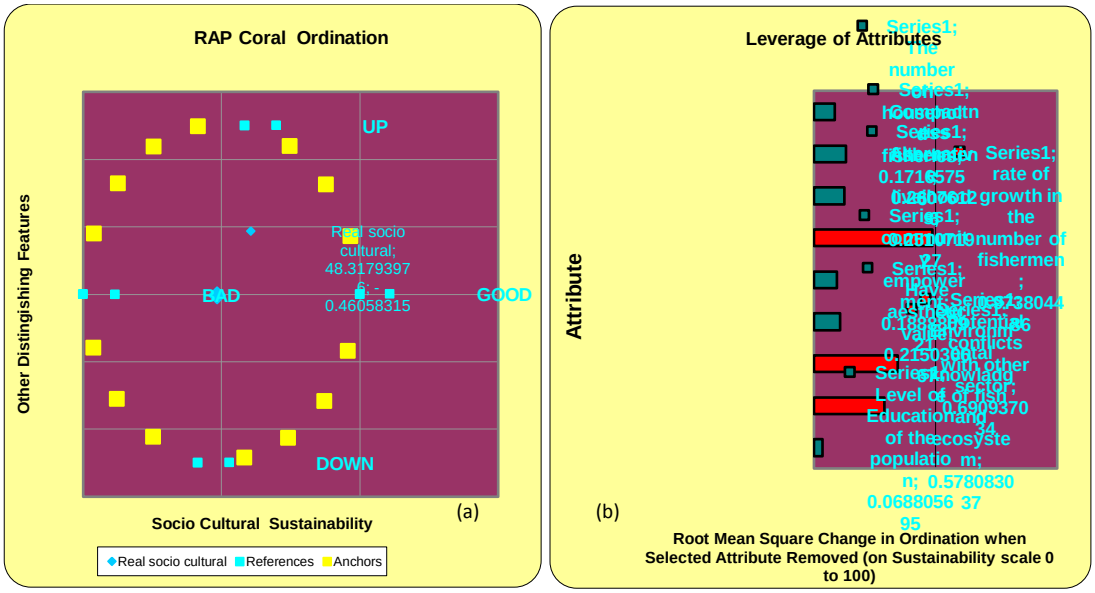

Figure 3 (a, b). Status and sustainability index and sensitive attributes affect the dimensions of socio-cultural

4.4 Determination of Status of Sustainability Multidimensional (MDS)

To determine the status of sustainability multi-dimensional to sustainably manage terumbuh coral in the coastal city of Ambon it must be done with the evaluation of the assessment of each dimension of analysis results MDS with each index value of sustainability as well as the value of the index Monte Carlo evaluated bedasarkan weight value weighted and value weighted index which is calculated from the results of the analysis results. (see table 2)

Table 2. Determination of multidimensional sustainability status

No	Sustainability dimension	Sustainability index	Monte Carlo Value	Iterasions	Weight value	Multi-dimensional index weighting results
1	Economy	54.47	53.98	2	25.26	14.81
2	Ecology	57.90	57.06	2	35.81	18.24
3	Social and cultural	48.32	48.31	2	38.93	21.45
Multi Dimensisustainability Status Index (MDS)						***54.50***

source; Results of the analysis of 2015

Based on the table 2 above and according to the results of multi-dimensional analysis of the three dimensions, namely; ecological dimension, the dimension of economic, social,

cultural, and institutional management of coastal areas to the current (existing condition), the obtained values of sustainability multi-dimensional indexes are in good status with sustained enough category with a value of 54.60%. From the analysis of multi-dimensional as shown in Table 2, and Figure 6 (diagram overpass), it can be said in terms of strength sustainability, management of coral reefs in the city of Ambon included in the category is quite sustainable because it is based on 3-dimensional analysis results are included in the category is quite sustainable. Based on the assessment of the 27 attributes of the three dimensions of sustainability were analyzed, there are 9 very sensitive attributes affect the sustainability of coastal zone management with RMS values that need interventions to improve the sustainability status of coastal zone management Ambon city. Repairs to 9 of these attributes is the responsibility of all stakeholders concerned and interested in the management of coastal areas in the city of Ambon in particular efforts to manage reef resources. but that is especially important is the role of the central Government, provincial governments Maluku and Ambon city government together with the community in the coastal area management efforts Ambon city especially its coastal resources which exist in the region, both for Ambon Bay Inside and Ambon bay outside.

Tabel 3. Perbedaan Nilai Indeks Keberlanjutan Analisis Rap-COSTALAMBON MDS dengan Analisis Monte Carlo

dimensions Sustainability	**Index Value Difference**		**Difference Value**
	MDS	**Monte Carlo**	
Ecology	57.90	57.06	0.84
Economi	54.47	53.98	0.49
Socio-culture	48.32	48.31	0.01
Multi-dimension	**54.50**	**53.11**	1.39

Source: Results of the analysis 2015

MDS analysis in accordance with Rap-COASTAL AMBON to see the error rate Monte Carlo analysis, this analysis was performed on approximately 95% confidence level. Based on the results of Monte Carlo analysis, shows that an error in the analysis of MDS can be minimized. This condition can be seen from the value of sustainability index on MDS analysis is not much different from the value of the index at the Monte Carlo analysis (see Table 3). It can be concluded that the level of error in the analysis process can be minimized, both in the manufacture of scoring each attribute, variation of scoring due to differences in opinion are relatively small, and the process of data analysis that is done over and over again stable, as well as errors in the input data and the data lost can be avoided.

Table 4. Results Analysis Rap-COASTAL AMBON for Stress Value and coefficient of determination (R2)

dimensions Sustainability	Stress	R^2	iteration
Economic	0,135	0.952	2
Ecology	0.135	0.951	2
Socio-cultural	0,158	0.943	2
multidimensional	0.142	0.948	2

Source; Results of the analysis of 2015

From the analysis according to table 4 shows that each dimension of the multi-dimensional and has a value of "stress" which is much smaller than the provision which states that the "stress" on the analysis by the method of MDS is sufficient if the obtained value <0:25. Because the smaller the value of "stress" which earned means the better the quality of the analysis performed. In contrast to the coefficient of determination (R2), the better the quality of analytical results if the value the greater the coefficient of determination (close to 1). Thus, from the second parameter (the value of "stress" and R2) indicates that all attributes used in the analysis of sustainability of coral reef management system in the coastal area of the city of Ambon is good enough in light of the three dimensions of development are analyzed.

The analysis results are considered accurate and reliable if the stress value of no more than 0.25, or 25 percent and the coefficient of determination (R) close to the value of 1.0 or 100 percent (Kavanagh and Pitcher, 2004). From the analysis of the MDS with the Rap-COASTALAMBON show that all attributes assessed inferred quite accurate and can be justified scientifically. It can be seen from the stress values ranging between 13% to 15%, and the coefficient of determination (R) obtained from every dimension, including the value of R multi-dimensional range of 0.94 to 0.96.

4. Conclusions

Results of the analysis of the sustainability of the management of coral reefs in the coastal area of the city of Ambon is multi-dimensional with the dimensions of ecology, economy and social culture through Rap-COASTALAMBON can be summarized as follows. Multidimensional management of coral reefs in the coastal areas of Ambon city can be quite sustainable with the multi-dimensional sustainability index amounted to 54.50%. For the sustainability status of each dimension is obtained economic dimension is included in the category of fairly sustained with sustainability index 54.47%, quite sustainable ecological dimensions of sustainability index 57.90%, social and cultural dimensions less sustainable with the index 48.32%, which is sensitive Attributes influential or need to intervene to increase the sustainability of coastal zone management status of Ambon city in a sustainable manner by 9 attributes of 27 attributes, among others; The ecological dimension; (1). the species has protected (2). water conditions (3). The total area protected. Namely economic

dimension; (1). Marketing of fishery (2). Base on the income levels of fishermen proverty line number (3). arrest effort based on the intensity of fishing activities socio-cultural dimension. (1) The rate of growth in the number of fishermen (2) Potential conflicts with other sectors (3) Environment knowladge of fish and ecosystem Through analysis of Multi-Dimensional (MDS) and Monte Carlo analysis can show the influence of the error with an error rate at the level of confidence 95 percent with stress values ranging between 13% - 15%, the value of determination (R2) ranges from 0.94 to 0.96 (less than 1.0). It can be concluded that the analysis by Rap-COSTALAMBON can be used to evaluate the level of sustainability of coral reefs in the coastal area of the city of Ambon.

Of the 27 attributes were analyzed to sustainably manage terumbuh reefs in coastal areas of Ambon to approach 3 dimensions, namely the ecological, economic, social, cultural, then gained 9 attributes that are very sensitive and very influential and must intervene to increase the value index of sustainability for a time and period which will come. This is very important in reef management efforts in coastal areas of Ambon city in a sustainable manner. Efforts to manage these attributes in a way to increase the role of each of the attributes that have a positive impact on the sustainability index and suppress any attributes that affect negatively to the sustainability index of each dimension in order to increase the value of sustainability index in multi dimensions of status quite (fairly continuous) <75% , being a good status (ongoing)> 75% for management of coral reefs in the coastal area of the city of Ambon.

Acknowledgements

I extend a big thank you and sincerely through this opportunity to associate professor in the scope of Pattimura University related to my research and have helped research gratitude same also due to all government agencies Ambon city, village and country and organization (NGOs) and communities in the area of research that helped for the implementation of this study.

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