

Problem Identification of Marine Cadastre in Indonesian Archipelagic Perspective

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Abstract. Indonesia as an archipelagic country has marine area larger than land area, 13.446 islands (Geospatial Information Agency, 2012) with coastline 95,181 km (Indonesian Maritime Council, 2008), making Indonesia has natural resources of the sea more than the natural resources on land. This potential conditions of marine resources is seen as an opportunity for Indonesia as a developing country to build excellence in coastal and marine field. But during 68 years of the nation's independence, maritime sector has not proved as a sector that can be seeded by the nation and relied by Indonesian people. Based on the literature, one of the main problems in Indonesian ocean is marine boundaries determination are unclear and unresolved causes uncontrolled human intervention in managing marine resources and chaotic patterns of use of marine resources, uncontrolled utilization even destructive.

This paper discusses about marine boundaries problems that is happened in Indonesia whether they arise from the country and from abroad. Until now much of Indonesia marine boundaries with neighboring countries are still unfinished. Implementation of UUD 1945 Article 18 and 25 juncto Law No. 32/2004 juncto Regulation of the ministry of home affairs No. 1/2006 about determination and demarcation of boundaries (including marine boundary) hasn't realized. There is no certainty boundaries of exploitation and utilization activities in ocean space by institutional (sector), nor implementation of marine management in eastern Indonesia that more often faced with the existence of customary marine management caused overlapping claims marine areas that can raise marine boundaries conflicts between regions, sectors or customary.

In general, marine cadastre deals with how states define, organize and manage marine boundaries in their countries. This condition causes marine cadastre concepts in continental countries such as America, Canada, and Australia can not be fully implemented in Indonesia. Marine cadastre concept for Indonesia should adopt the archipelago needs, in the context associated with UNCLOS'82, Law No. 32 2004 about regional autonomy, Law No. 27 2007 about coastal management areas and small islands, and customary marine authority. This paper is part of dissertation research in order to build model of marine cadastre system uses evaluation definition approach and geospatial information principles.

Keywords: *Marine Boundaries, Marine Cadastre, Archipelagic Perspective*

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INTRODUCTION

1. Definition of Cadastre

The term Cadastre is etymologically derived from the Greek *katastikhon* meaning public list showing details of ownership and value of land that was originally made for the purposes of taxation. The term of cadastre has existed in Indonesia introduced by the Dutch colonial government in 1823 with establishment *Kadasterale Dienst* (Cadastral Bureau) and the Japanese colonial period called Land Registry Bureau under Department of Justice, after the proclamation of independence later switched to Ministry of Home Affairs, and in 1955 switch to Ministry of Agrarian, in 1966 changed to Directorate General of Agricultural Department of Home Affairs, then became a non-departmental government agency with the name National Land Agency. (Rais, 2002). After the enactment of Law No. 5 of 1960 on Basic Agrarian Law (UUPA), the term cadastre has been rarely used and more often use term Land Registry.

In Indonesia, data recording and information organized by land registration activity. Article 19 (1) UUPA notes to ensure legal certainty, government held land registration throughout the territory of the Republic of Indonesia in accordance with the provisions set forth by government regulations. Article 19 (2) the registration under subsection (1) of this article include:

- a. Measurement, mapping and land administration.
- b. Registration rights of land and transfer of such rights.
- c. Granting letters are valid proof of copyright as a strong verification tools. (Land Certificate).

International Federation of Surveyors (FIG) in 1995 defined Cadastre as follows:

A Cadastre is normally a parcel based, and up-to-date land information system containing a record of interests in land (e.g. rights, restrictions and responsibilities). It usually includes a geometric description of land parcels linked to other records describing the nature of the interests, the ownership or control of those interests, and often the value of the parcel and its improvements.

Based on above definition, cadastre has 3 (three) main elements namely: right, restriction and responsibility. These three elements are interrelated, if it placed in land urgency can be made statement that right will be granted based on land uses in accordance with boundaries as measured and defined. Restriction is a jurisdictional boundaries or limits the right of ownership relationship between people and land, can be interpreted that the right does not apply outside the limits owned. While the responsibility will always follow the right and restriction.

The three main elements of land cadastre can be approximated in physical form as Land Certificate. Land Certificate is a living archive that will not / never destroyed like other archives, it means always well maintained despite change in subject (land owner), changes in types of rights, and the imposition of changes in land stewardship obligations. It is therefore very different from the other certificate ownership and not as a product of community service. Literally, land certificate more functions as a

control tool for management control, ownership, use and exploitation of land to the unconditioned sense of justice in the ownership and control of land use to prosperity and preserving environmental quality.

Land characteristics that relatively static, causing the land can be owned and very easy to determine the rights, restrictions and responsibilities. However this condition occurs that approximately 85 million parcels of land are eligible to be registered until now only about 27 million parcels of land that have been registered (BPN, 2006). This conditions are the problems that occurred in Indonesia's land with an area of 1,910,931.32 km² (Ministry of Internal Affairs, 2012).

2. Definition of Marine Cadastre

Indonesia as an archipelagic country has marine area larger than land area, 13.446 islands (Geospatial Information Agency, 2012) with coastline 95,181 km (Indonesian Maritime Council, 2008), making Indonesia has natural resources of the sea more than the natural resources on land. This potential conditions of marine resources is seen as an opportunity for Indonesia as a developing country to build excellence in coastal and marine field.

Placement principle of land cadastral in the sea area is known and often referred as marine cadastre. Marine cadastre in simple terms can be regarded as the application of cadastre principles in marine area. In general, marine cadastre aims to administer marine space and marine resources including all interests, rights, restrictions and responsibilities that exist in the marine area. Marine cadastre concept lies in recording activities in the ocean by measuring the boundaries of the sea parcel. Sea parcel boundaries and identity depicted in a map large scale is accompanied by a note regarding right type, size, usage, value, insurance and other data, including restrictions on use.

Marine cadastre concept already used in some countries (non-islands) such as Australia, Canada and America. In Australia in 1999, Hoogsteden, Robertson, and Benwell formulate definitions marine cadastre as follows: marine cadastre is a system to enable the boundaries of maritime rights and interests to be recorded, spatially managed and physically defined in relationship to the boundaries of other neighboring or underlying rights and interests. Then in 2004 Anderw Binns defined marine cadastre is a spatial boundary management tool which describes, visualises and realises legally defined boundaries and associated rights, restrictions and responsibilities in the marine environment. Australian marine cadastre is used to achieve Australia's Marine Management System which was then used to regulate the activities of oil and gas sector, fisheries, aquaculture, shipping, conservation, marine heritage, cables and pipelines, coastal zone. Australian marine cadastre concept has been implemented in some states such as Queensland and Victoria.

In Canada in 2000 organized a Good Governance of Canada's Oceans to resolve the boundary problem as a first step to realize effective and fair marine management the effective management. Marine cadastre is defined by Nichols, Monahan and Sutherland as follows: *a marine cadastre is a marine information system, encompassing both the nature and spatial extent of the interests and property rights, with respect to ownership and various rights and responsibilities in the marine jurisdiction.*

In 2002 United States Department of Communication (U.S. DOC)-National Oceanic and Atmospheric Administration (NOAA) marine cadastre formulate definition: *The U.S Marine Cadastre is an information system, encompassing both nature and spatial extent of interests in property, value and use of marine areas. Marine or maritime boundaries share a common element with their land-based counterparts in that, in order to map a boundary, one must adequately interpret the relevant law and its spatial context. Marine boundaries are delimited, not demarcated, and generally there is no physical evidence of the boundary.*

How about Indonesia as the largest archipelago in the world? Marine cadastre in Indonesia is still a new concept, because Indonesia's development most priority in the land, whereas the sea area larger than the land area. However more research is concern in management coastal and marine spatial planning with the various aspects and approaches, but not much research concern with the cadastral elements: right, restriction and responsibility in the exploitation and utilization of ocean space.

3. Identification of Marine Cadastre Issues in Indonesia

3.1 Laws

There are 18 of Law Marine Affairs and Fisheries, 35 Government Regulation, 11 Regulation and Presidential Decree, 2 Presidential Instruction, 14 Regulation and Decision of the Minister Marine and Fisheries, 16 Regulations and Decision of Ministry Energy and Mineral Resources, 7 Regulation and Decision of Environment Minister Life, 3 Regulation and Decision of Minister Communications, 3 Regulations and Decision of Ministry Culture and Tourism, 3 Regulation and Decision of Minister Trade, 4 Regulation and Decision of Minister Industry, 2 Regulations and and Decision of Minister National Development Planning.

Law

1. No. 16 2006 Extension System for Agriculture, Fisheries and Forestry
2. No. 31 2004 Fisheries
3. No. 6 1996 Indonesian Waters
4. No. 16 1992 Animal, Fish and Plant
5. No. 9 1985 Fisheries
6. No. 17 1985 UNCLOS Ratification
7. No. 1 1983 Ratification Agreement between Indonesia and Malaysia on the Legal Regime of the State and the Rights Archipelago Malaysian Archipelago Territorial Sea and the waters and air space over the territorial sea, waters and the archipelago of Indonesia region located between East and West Mayalsia.
8. No. 5 1983 Indonesian Exclusive Economic Zone
9. No. 11 1974 Water
10. No. 1 1973 Indonesian Continental Shelf
11. No. 16 1964 Fishery Sharing
12. No. 16 2006 Duties and Functions Execution Moratorium Fisheries Tribunal referred to in Article 71 Paragraph (5) of Law No.31 of 2004 on Fisheries
13. No. 10 2009 Tourism.
14. No. 11 2010 Heritage.

15. No. 17 2008 Sailing
16. No. 33 2011 National Policy of Water Resources Management
17. No. 7 2004 Water Resources
18. No. 25 2004 National Development Planning System

Government Regulation

1. No. 20 2006 Irrigation
2. No 24 2006 Procedures for Appointment and Dismissal Ad Hoc Court of Fisheries.
3. No 36 2002 Rights and Obligations of Foreign Ships in implementing the Peace Cross through Indonesian waters.
4. No 37 2002 Rights and Obligations of Foreign Ships and Aircraft exercising the right of archipelagic sea lanes passage through the established archipelagic sea lanes.
5. No.38 2002 Geographic Coordinates points Kuala line Indonesian Islands.
6. No 54 2002 Fishery.
7. No.58 2002 Tariff on Non-Tax State Revenue applicable to the Ministry of Marine Affairs and Fisheries in the Marine and Fisheries Research Services.
8. No.142 2000 Tariff on Non-Tax State Revenue applicable to the Ministry of Maritime Affairs and Fisheries.
9. No.7 2000 Sailor.
10. No 23 2000 Company Ocean Fisheries Infrastructure.
11. No.141 2000 Second Amendment to Regulation 15 of 1990 on Fisheries Enterprises.
12. No. 19 1999 Pollution Control and / or Destruction of Sea.
13. No. 82 1999 Transportation in the waters.
14. No. 21 1998 Dissolution Public Corporation (Perum) Fisheries Maluku, Incorporation Limited Liability Company (Persero) PT.Perikani, PT.Tirta Kingdom Mina and PT.Perikanan Big Samodra into Capital Stock PT.Usaha Mina.
15. No 1998 61 Geographic Coordinates Dots Outline Kuala Indonesia in the Natuna Sea Islands.
16. No. 1 1995 Capital Additions Peyertaan the Republic of Indonesia to the Housing Capital Infrastructure Ocean Fisheries.
17. No.64 1993 Amendment Government Regulation No. 15 1990 Fishery Business.
18. No. 2 1990 Housing Infrastructure Ocean Fisheries.
19. No. 15 1990 Fishery.
20. No. 39 1990 Transfer of Fisheries Perum to Persero Maluku.
21. No. 40 1990 Transfer of the State Fisheries Company (PN Perkani) North Sulawesi / Central became Persero.
22. No. 17 1988 Implementation and Utilization of Sea Transport.
23. No. 3 1981 Dissolution of the State Fisheries Company in Riau and Combined Limited.
24. No. 4 1981 Company Dissolution Fishery East Java and South Sulawesi State Fisheries Company / South-East and Combined into PT.Perikanan Samodra Great.
25. No. 5 1981 Liquidation Company Unitary Central Java Fisheries and Marine Company and State Results Combined into PT.Tirta Kingdom Mina.
26. No. 61 2009 Harbor.
27. No. 22 2011 Transportation on Water.
28. No. 5 2010 Navigation.
29. No. 21 2010 Protection of Maritime Environment
30. No. 51 2002 Boating.
31. No. 12 2000 Search and Rescue.
32. No.16 2004 Land Stewardship.

33. No.82 2001 Water Quality and Water Pollution Control.
34. No.42 2008 Water Resources Management.
35. No.19 1999 Pollution Control and / or Destruction of Sea.

Regulations and Presidential Decree

1. No. 44 2005 Ratification of the International Convention on Maritime Liens and Mortgages (International Convention on Maritime and Mortgage receivables) 1993.
2. No.78 2005 Management Outlying islands.
3. No. 33 2002 control and supervision over exploitation of sea sand.
4. No. 1 2001 Revocation Decree No.31 of 1987 on Ratification of Agreement for the Establishment of the Intergovernmental Organization for Marketing Information and Technical Advisory Services for Fishery Products in the Asia Oacific Region (Infofish).
5. No. 126 2000 Amendment of Presidential Decree No.27 of Establishment 1993 about Fisheries High School.
6. No. 145 1999 changes the name of the Minister to the Minister of Marine Exploration Marine Exploration and Fisheries.
7. No.178 1999 Ratification of Agreement Relating to the Implementation of Part XI of the UNCLOS 1982.
8. No.77 1996 Marine Board of the National.
9. No. 27 1993 High School Fishing.
10. No. 23 1982 Mariculture Development in Indonesian Waters.
11. No. 12 2010 National Border Management Agency.

Presidential Instruction

1. No. 2 2002 Sea Sand Mining Control.
2. No. 16 2005 Policy Development Culture and Tourism

Regulation and Decree of the Ministry of Maritime and Fisheries Affairs

1. Per.13/Men/2006 Organizational Change fund Procedures of the Ministry of Maritime and Fisheries Affairs.
2. Per.18/Men/2006 Scale Fisheries Management.
3. Per.12/Men/2005 Giving Relief to Indonesia Fishing Companies that do business by using the Fishing Vessel Catcher / Fish Carrier Sized More Than 30 Gross Tonnage (GT) up to 60 GT.
4. Per.13/Men/2005 Forum Handling Crime Coordination in the Field of Fisheries.
5. Per.14/Men/2005 National Commission of Fish Resources Assessment.
6. Per.15/Men/2005 fishing and / or farming fish in Regional Fisheries Management of the Republic of Indonesia is not for commercial purpose.
7. Per.18/Men/2005 Crime Coordination Forum Handling in the Field of Fisheries.
8. Kep.17/Men/2005 Determination Coat Ministry of Marine and Fisheries Affairs.
9. Kep 18/Men/2011 General Guidelines Minapolitan.
10. Kep 32/Men/2010 Minapolitan Zone Determination.
11. Kep 39/Men/2011 Change Region Minapolitan.
12. Kep 45/Men/2011 Fish Resource Potential Estimates in Regional Fisheries Management of the Republic of Indonesia.
13. Per.01/Men/2009 Regional Fisheries Management of Republic Indonesia.
14. Per.02/Men/2009 Procedures for Water Conservation Area Determination

Regulation and Decree of the Minister of Energy and Mineral Resources

1. Per.46/Men/2006 Management Drilling Mud, Mud Waste and Drill powder on Activities Oil and Gas Drilling.
2. Per.28/Men/2006 Guidelines and Procedures for the Implementation of the General Survey in the Upstream Oil and Gas.
3. Per.27/Men/2006 Management and Utilization Data obtained from the General Survey, Exploration and Exploitation of Oil and Gas.
4. Per.26/Men/2006 Provision of fuel oil in the Framework of the National Empowerment Shipping Industry.
5. Per.18/Men/2008 Reclamation and Closure.
6. Per.5/Men/2007 Guidelines Geothermal Preliminary Survey Assignment.
7. Per.19/Men/2009 Gas Business Activities Through Pipes.
8. Per.13/Men/2009 Groundwater Basin.
9. Per.12/Men/2011 Zoning Procedures Enterprises and Regional Information Systems Mineral and Coal Mining.
10. Per.1/Men/2011 Offshore Installation of Oil and Gas.
11. Kep.1321/Men/2005 Transmission Network Master Plan and the National Natural Gas Distribution.
12. Kep.1565/Men/2008 Permit Transportation of Crude Oil and Natural Gas To PT.Pertamina.
13. Kep.1568/Men/2008 Business License Commercial Oil and Gas To PT.Pertamina.
14. Kep.2010/Men/2009 Zoning Designation Geothermal Preliminary Survey.
15. Kep.1110/Men/2009 Permit Transportation of Natural Gas through the pipeline to PT.Pertamina.
16. Kep.1128/Men/2004 National Coal Policy.

Regulation and Decree of the Minister of Environment

1. Kep.201/Men/2004 Raw Criteria and Guidelines for Mangrove Damage Determination.
2. Per.3/Men/2007 Facility Collection and Storage of Hazardous and Toxic Waste in the Port.
3. Per.4/Men/2007 Wastewater Quality for Business and / or Activity Oil and Gas and Geothermal.
4. Per.6/Men/2007 Wastewater Quality Standard for Enterprises and / or activity of Fishery Products Processing.
5. Per.12/Men/2006 Licensing Requirements and Procedures for the Disposal of Wastewater to Sea.
6. Per.12/Men/2007 Document Management and Monitoring of Environment for Business and/or activities that do not have the Document Management Environment.
7. Per.12/Men/2008 Wastewater Quality for Business and/or Events Management Seaweed.

Regulation and Decree of the Minister of Transportation

1. Per.1/Men/2010 Publishing Approval Procedures Sailing.
2. Kep.3/Men/2008 Seafarers' Identity Documents.
3. Per.48/Men/2011 Procedure Requirements Permit Use Foreign Ships for another activity that does not include activities of transporting passengers and/or goods in maritime transport activities in the country.

Regulations and Decree of the Ministry of Culture and Tourism

1. Per.48/Men/2010 Guidelines for Management of Underwater Heritage.
2. Per.10/Men/2010 Travel Business Registration Procedures Tirta.

3. Per.89/Men/2010 Registration Procedures for Transportation Service Business Travel.

Regulations and Decree of the Ministry of Trade

1. Per.14/Men/2008 Technical Verification or against certain Mining Products Export.
2. Per.19/Men/2007 Tin inter-island trade.
3. Per.36/Men/2011 Rattan transport Rattan inter-island.

Regulation and Decree of the Ministry of Industry

1. Per.41/Men/2008 Provisions and Procedures for Industrial Business Permit, Permit Extension and Industry Registration Certificate.
2. Kep.117/Men/2003 Moratorium Export of Sea Sand.
3. Kep.641/Men/2002 Determination HPE amount of sea sand.
4. Kep.441/Men/2002 Sea Sand Export.

Regulation and Decree of the Ministry National Development Planning

1. Per.7/Men/2007 Amendment Decree of Ministry of Rural Development.
2. Kep.1/Men/2005 National Strategy for Development of Disadvantaged Regions.

Laws and regulations shows that marine of Indonesia managed by many ministries (sector), this fact can be determined based on the type and number of regulations issued by the Indonesian government over the years related to the implementation of marine management activities undertaken by each sector, has not been associated with provincial government regulations, city/ county. This condition often leads to national marine resources are managed by partial (based on sector legislation), each stand-alone (not integrated) and unfocused (managed without planning together). The impact of the above conditions are vulnerable marine resource management conflicts between sectors and between regions.

Some examples of sectoral legislation that is not related to the implementation of integrated marine use:

1. Licensing the use of the Ministry of Maritime and Fisheries Affairs and the Ministry of Forestry in the management of marine protected areas. Ministry of Forestry refers to Law No. 5 1960 about Conservation of Natural Resources and Ecosystems, and the Law No.41 1999 about Forestry. Ministry of Maritime and Fisheries Affairs refers to Law No.31 2004 about Fisheries and the Law No.27 of 2007 about Management of Coastal Areas and Small Islands.
2. Pollution cases: (a) by PT. Newmont Minahasa Raya in Buyat Bay. This case showed no relation between the Law No.11 1967 about Mining and Law No.23 1997 about Environment. (b) leakage of pertamina's oil/gas pipeline. This case shows no relation between the Law No.9 1985 about Fisheries and Law No. 22 2001 about Oil and Gas.
3. Case Citanduy sodetan plan. This case shows no relation between Law No.22 1999 about Regional Government and Law No.41 1999 about Forestry.
4. Revocation of Article 1(18),16, 17, 18, 19, 20, 21, 22, 23 (4) and (5), 50, 51, 60 (1), 71 and 75. Whole articles related Hak Pengusahaan Perairan Pesisir (HP3) in the Law No.27 2007 declared invalid by the decision of the Constitutional Court No. 3 / PUU-VIII / 2010 because contradiction with the Constitution of the Republic Indonesia (UUD 1945) and do not have binding strength.

3.2 Marine Boundaries Problems

Under the Constitution of the Republic of Indonesia 1945 Section 18 (1) the Unitary Republic of Indonesia is divided into regional provinces, the area province is divided into districts and the city of each of them has arranged with local government legislation reserved. Article 25 states that the Republic of Indonesia is an archipelago island nation that characterized the region and the boundaries and rights stipulated by law. Those two article above confirms that each province, district and city have rights and their limits that should be set by the law. For the determination of the boundaries of the area provided in Law No.2 1999 (amended by Law No. 32 2004) about Regional Government, and Regulation of the Ministry of Home Affairs No. 1/men/ 2006 about Guidelines for Confirmation of Regional Boundaries. For the determination of the rights provided in Law No.27 2007 about the Management of Coastal Areas and Small Islands.

Law No.32 2004 the central government authorizes the local authority is not limited to purely administrative affairs but also in terms of resource utilization and its wealth management including marine resources. This confirms that the Indonesian marine are managed by a local government that has marine boundary authority to manage marine resources in the most distant 12 nautical miles (for provinces) measured from the shoreline toward open sea and/or the direction of the archipelagic waters, and 1/3 (one third) of the jurisdiction of the provinces for districts/cities. If the sea area between two (2) provinces less than 24 miles the authority to manage marine resources in the region shared the same distance or measured in accordance with diameter principles, and for the county/city to obtain third (one-third) of provincial jurisdiction in question.

Implementation of this law has yet to be realized by each province and county/city located in coastal and marine Indonesia due to limited human resources and inadequate financial resources to conduct marine boundary determination and affirmation. It's implications if the marine boundary is not clear that it caused overlapping claims marine areas will lead marine border disputes conflict between provinces, between provinces and county/city and inter-county/city, such as the problem of DIY marine boundary between province of Central Java, determination marine boundary Pasuruan between Bangkalan, or Block Maleo grabs problem that the government of East Java Province with local government Sumenep related to oil and gas exploration results which potentially cause destruction and pollution in coastal and marine areas.

3.3 Coastal Areas and Small Islands Management Problem

Law No.27 2007 about Management of Coastal Areas and Small Islands which specifically regulate the coastal zone management process from the planning stage, utilization, supervision and control carried out by the central government and local governments. Law No.27 2007 emphasized that the model of coastal zone and marine management in Indonesia based on the system of regional autonomy. This law introduced the Coastal Water Concession Rights (HP3), is the right to certain parts of the coastal waters for marine and fisheries business, as well as other business related to the utilization of coastal resources and small islands that include the sea surface and water column to the sea floor at a certain width boundary (Article 18). But in 2010 based on the decision of the Constitutional Court of the Republic of Indonesia No. 3/PUU-VIII/2010 that the Coastal Water Concessions Rights (HP3) conflict with the Constitution of the Republic of Indonesia (UUD)1945 and has no binding force. Until now there is no substitute for the articles (related HP3) were "lost", this

condition indicates that the implementation of coastal and marine area management in Indonesia has not received the full attention of the government.

Coastal and marine management in Indonesia as an archipelagic country based on local autonomy system has high degree of difficulty remembering the number of county/cities in Indonesia are 497 counties/cities, 324 counties/cities that have coastal areas (Ministry of Home Affairs, 2010). Every Indonesian coast have different characteristics from one another so that different ways to manage the coastal areas. That's why policies and institutional instruments formulated were not the same. This course will also influential in providing data and information on the management of coastal and marine areas in each region will be different (diverse).

Data and information related coastal and marine management, Law No. 27 2007 Section 15 states that: (1) Government and local governments are required to manage data and information on coastal areas and small islands. (2) Updating data and information by governments and local governments periodically and formally documented and published as a public document in accordance with the legislation. (3) Data and information referred to in paragraph (1) may be used by any person and/or key stakeholders while considering the interests of the government and local government. (4) Any person who utilize the resources of coastal and small islands referred to in paragraph (2) shall submit data and information to the government and/or local government no later than 60 working days from the commencement of the use. (5) Changes in data and information referred to in paragraph (1) may only be made with the consent of the government and/or local governments. (6) Guidelines for the management of data and information on the management of coastal areas and small islands set out in the ministerial regulations.

Besides managed by local government, national marine resource also managed by sector. Provisions of the 1945 Constitution juncto Article 33 Paragraph (3) UUPA juncto UNCLOS juncto Law 17 1985, marine can be partitioned in a parcel for exploitation and utilization, for example economical business space such as fish farming, seaweed, shellfish, seabed mining, as a space marine reserves and national parks, tourism and recreation, and public spaces such as ocean shipping lanes, ports and so on (Rais, 2002). Each sector (marine fisheries, mining, transportation, environment, tourism, defense and security, energy, mineral resources, commerce, industry and others) have different systems and policies, different perspective and also different management (managed without a clear plan together) causes marine boundaries overlap, example: fish farming zone overlap with shipping lanes lead to farming revenue fish disruption, or fishing zone overlaps with navy defence zone lead to fishermen income disruption. There is no certainty boundaries in marine areas causing marine economic activities such as fishing, aquaculture, industrial biotechnology, marine tourism, marine transportation, conservation, exploration and exploitation will be hampered.

The marine management in western Indonesia has more complexity than eastern Indonesia, it can be proved by number of sectors involved in marine management and conflicts diversity between sectors and between regions, such as happened in Madura Strait- East Java. Madura Strait is surrounded by nine (9) counties: Sumenep, Pamekasan, Sampang, Bangkalan, Sidoarjo, Pasuruan, Probolinggo, Bondowoso, Situbondo, and 3 (three) cities: Surabaya, Pasuruan and Probolinggo so that marine boundaries authority between local government adjacent or opposite is very important (in Indonesia there are 324 of 497 autonomous regions counties/cities have coastal areas (Ministry of Home Affairs, 2010)).



Figure 1. Local administrative area in Madura Strait East Java (Administrative Map of East Java Province, 2010).

Figure 1 shows that land boundaries has been mapped, while marine boundaries has not been mapped. The authority to manage marine resources in 12 miles for provincial and 1/3 miles from 12 miles for city/county (Law 32 2004) has not materialized.



Figure 2. Engineering activities of marine fisheries, mining, transportation and defense in the Straits of Madura East Java Province (Wisayantono, 2009).



Figure 2. Engineering activities of marine fisheries, mining, transportation and defense in the Straits of Madura East Java Province (Research Board and the Maritime & Fisheries, 2006).

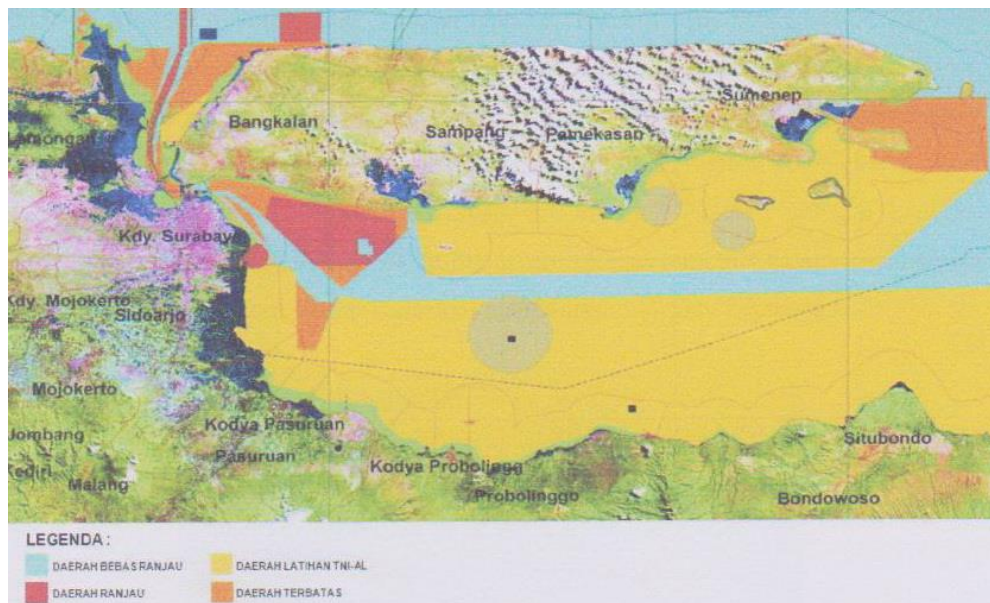


Figure 3. Marine engineering activities for defense in Madura Strait East Java (Research Board and the Maritime & Fisheries, 2006).

3.4 Customary Marine Tenure Problem

Different conditions and problems in western Indonesia, implementation of marine management in eastern Indonesia more often confronted with existence of customary marine management and emergence of problems between indigenous and local governments. There are 10,640 of 69 249 villages in Indonesia (over 14%) is a coastal village with an area 35,949,021.30 ha or 19% of total villages area in Indonesia. Approximately 92% of coastal villages in eastern Indonesia is traditional

village who practice natural resource management based on local culture (Grand Design Rural Development, 2009). The problem is customary marine boundaries are determined based on customary laws prevailing in the region, as happened in Maluku province.

Maluku province has marine area 527.191 km², land area 54.185 km², and 559 islands (Maluku in Figures, 2011). Maluku province as the largest archipelago in Indonesian province discovered many indigenous villages existence that utilize archipelagic waters based on the local culture.



Figure 4. The geographical position of Maluku Province (BPK Maluku Province, 2003)

Maluku Province fisheries management practices based on local wisdom has long known as *petuanan* and *sasi*. *Petuanan* refers to exclusivity land area (*petuanan darat*) and marine area (*petuanan laut*), while *sasi* concept associated with customary rights that regulates system of exploitation existing resources in marine (*petuanan laut*). Generally *sasi* is legal provision about prohibition to enter, take or do something in a particular area within certain period (Wahyono, 2000).

Some villages in Maluku province that apply *sasi* for marine resource management:



Figure 5. Some villages in Maluku province that apply *sasi*.

Further explanation *petuanan laut* and *sasi* associated with cadastral elements (right, restriction and responsibility) are follows:

1. Rights

Traditional village had autonomy to regulate traditional village property include communal land, forests and water. Rights of indigenous marine (customary rights) is a set of rules or marine area management systems based on custom (tradition) made by the people of coastal villages. This rules of customary rights over who has rights to an area, the type of resources that may be captured and techniques that allowed to exploit the resources that exist within a sea area.

2. Responsibilities

Sasi performed jointly by all the villagers, however, village government made conservation responsible team for monitoring *sasi*. Either public or conservation team that found violations, they report to village government. There is system of sanctions applicable and adhered by community, both local people and communities outside the village. Verdict sanctions in accordance with the level or type of violation committed. In addition sanctions process imposed gradually.

3. Restrictions

In Central Maluku (Nolloth and Haruku, Ambon Island, Latulahat) and Southeast Maluku (Kei), *petuanan laut* as well as *petuanan darat* have boundaries that are relatively clear. If boundary of *petuanan darat* between region one village to another village adjacent form natural boundaries (rivers, hills, headlands, caves) or artificial boundaries (intentionally planted trees, poles) then *petuanan laut* (marine) boundary between villages, country and retscaap is an imaginary line drawn from *petuanan darat* (land) boundary extends straight out to sea. Claim ownership of an inland sea areas (islands) are still being determined along sea boundary line. Marine boundary between *petuanan laut* and public property or commom property is an imaginary line between the sea is shallow and the deep sea.

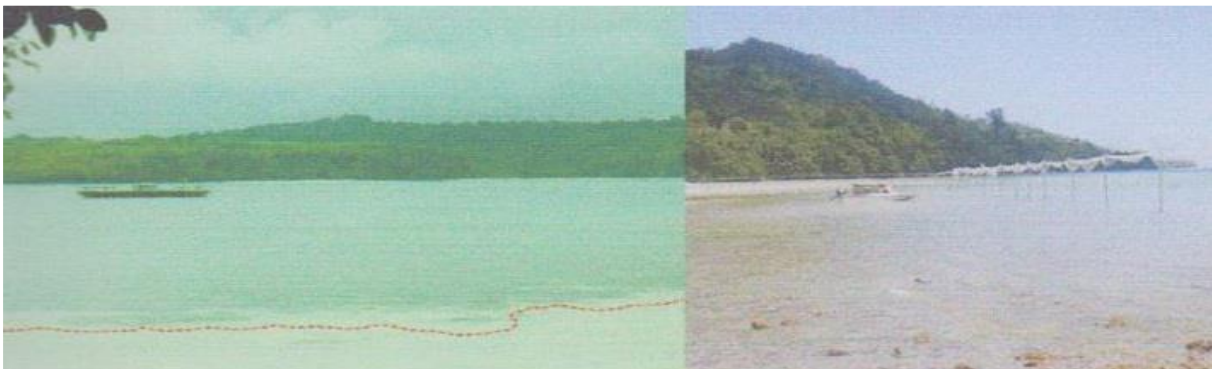


Figure 6. *Petuanan laut* boundary line based on imaginary and artificial boundary markers (Hernandi, et al, 2012).

Implications of customary marine delimitation induce boundaries conflict between traditional village (eg conflict Tutrean village with Sather village on Kei Besar island), village with outsiders (eg conflicts between Dian Village and Debut Village about license contract Oiwa Island to entrepreneurs pearl PT. Pear Nusantara in 1994), and customary marine border with local

government marine authority boundaries. The problem of indigenous and local wisdoms can not be avoided because the indigenous and local wisdoms is a part of Indonesian culture system.

4. Conclusion

From above discussion it can be concluded that the implementation of marine management in Indonesia is strongly influenced by the system of regional autonomy, sectoral and customary system. Marine cadastre depend with how a state, especially Indonesia as an archipelagic state in manage and organize marine resources, so that marine cadastre problem in Indonesia as an archipelagic country will be different from marine cadastre problems in non-archipelagic (continental) state. This condition causes the definitions of marine cadastre from continental states such as America, Canada and Australia can not be fully implemented in Indonesia. Therefore it'll be needed marine cadastre definition for Indonesia that appropriate with the characteristics of Indonesia as an archipelagic state, then used it to build model concept and management of marine cadastre in Indonesia as an archipelagic state.

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