Strategies for Trawl Fisheries By catch Management
REBYC-II CTI; GCP /RAS/269/GFF

Report of the Regional Workshop and Training on Application of Resources Mapping andGeographic Information System GIS)

BalaiBesarPenangkapanIkan (BBPPI) Semarang, Indonesia

29th September to 3rd October 2014

Summary

Under the training needs assessment carried out by SEAFDEC RFU in 2013, the use of Global Information Systems(GIS) was considered a high priority by all REBYC-II CTI countries.By using GIS applications they could improve the analyses and management of spatial data and present information in a more comprehensible format. In response to this request, the REBYC-II CTI project organized a regional workshop and training on Application of Resource Mapping and Geographic Information System GIS) from 29 September to 3 October 2014 at BalaiBesarPenangkapanIkan (BBPPI) Semarang, Indonesia. There were 9 trainees from the five REBYC-II CTI countries and 15 observers from the Ministry of Marine Affair and Fisheries, Indonesia. Four of the five REBYC-II CTI countries sent two participants, but Vietnam could only send one participant due to passport problems.

The objectives of the workshop and training course were threefold; (1)to exchange information, knowledge and know-how on the application of resources mapping among the REBYC-II CTI countries; (2) to help the participants to understand the concept and the use of Geographic Information System as a tool for natural resources management; and (3) to help the participants to understand and become familiar with the use of QGIS program for use in their resources management work.

The Workshop on Application of Resource Mapping was held on 29th September 2014. The first part of the workshop focused on resource mapping carried out to date-under the REBYC-II CTI Project. Indonesia and Philippines have progressed well in this respect; other countries still need more work and capacity building. The training on Geographic Information System (GIS) was held from 30th September to 3rd October 2014. Individual computers for practicing GIS applications were used throughoutthe training course.

Both pre-course and post-course evaluations were conducted; the latter showing that the workshop and training course were largely successful in meeting the three objectives. All the participants found the workshop and training sessions useful at least to some extent and some found the course extremely useful. The most useful topics were 1) practicing on coordinate conversion using spreadsheets, and 2) practicing on GPS recording (point, line, and polygon). A majority of the trainees commented that the period of the training was appropriate but they would have needed more time for practice sessions. The participants commented that both trainers were knowledgeable but there were some communication problems because of challenges in the language. The participants also noted that more instructors should havebeen present for supporting them during practical sessions. Feedback on the training method, course administration and logistical support indicated that the course was in general well managed and implemented.

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1. Background

The use of fisheries data and information for fisheries management has grown significantly in recent years. Large data and information sets, not only for fisheries but also on socioeconomic related issues are routinely collected by fisheries agencies. In order to utilize these data and information effectively, mapping techniques are used to transform them from numerical data into easily recognized formats. Various tools for mapping have used both less sophisticated and more sophisticated Information Technologies (IT).

The wider use of Global Information Systems (GIS) as a mapping tool started in the 1980s. During the early phase, GIS availability was limited to companies and universities that had expensive computer processing equipment. However, nowadays, anyone with a personal computer or laptop can use GIS software. Over time, GIS applications have also become easier to use. Earlier the users needed a lot of training to use GIS applications, but now it is much easier to get started, even for casual users. Nowadays, GIS has developed widely useful software applications and is able to handle all aspects of managing and using digital geographical and spatial data.

The benefits of using GIS fall into five basic categories:(1)Cost savings resulting from greater efficiency; (2) Better decision making; (3) Improved communication: (4) Better geographic information recordkeeping: and (5) Managing geographically(ESRI International User Conference, 2009). Improved Mapping, Monitoring and Modeling become possible through appropriate spatial analysis. The most common example of using GIS is to make layers with data, showing different variables to support decision-making and public use. GIS technology provides the power to instantly share and update real-time situations, allowing decision-makers to respond to changing circumstances quickly and allocate resources to locations more precisely.

Nowadays GIS software is widely available to the GIS users. Quantum GIS or QGIS is a user friendly Open Source Geographic Information System (GIS) licensed under the GNU General Public License. QGIS is an official project of the Open Source Geospatial Foundation (OSGeo). It runs on Linux, Unix, Mac OSX, Windows and Android and supports numerous vector, raster, and database formats and functionalities (QGIS, 2014).

In fisheries, GIS is an important tool for fisheries and resource management. Examples of GIS use in fisheries management include:Aquaculture Zoning, Vessel Monitoring Systems, and Monitoring of ConservationAreas or Marine Protected Area. GIS systems are particularly useful for the area-based management of trawl fisheries that the REBYC-II CTI Participating Countries have emphasized in their trawl fisheries management plans.

The Regional facilitation Unit (RFU) of REBYC-II CTI Project considers that training on GIS technologies that will benefit REBYC-II Participating Countries is very important. In response to this need, the RFU of REBYC-II CTI Project in collaboration with REBYC-II CTI –Indonesia organized a Regional Workshop and Training on the Application of Resources Mapping and Geographic Information Systems (GIS). The objective of this workshop cum training wasto develop the human capacity to use resource mapping and GIS programs in the REBYC-II CTI countries, as well as training in appropriate and applicable data collection and analysis processes for GIS. In order to save on national project budgets, the freeware QGIS was provided to participants during the training session.

2. Objectives

1. To exchange information, knowledge and know-how on the application of resources mapping among the REBYC participating countries;

2. To help participants to understand the concept and the use of Geographic Information System as a tool for natural resources management; and

3. To help participants understand and become familiar with the use of QGIS program for use in their resources management work

3. Outputs

1. Project staff of REBYC-II CTI Countries understand the concept of Geographic Information System and be able to collect and utilize the data through GIS system

2. Project staff of REBYC-II CTI Countries understand the application of GIS freeware i.e. QGIS program and be able to apply with their own data

3. Application of resource mapping techniques applied by REBYC-II CTI Countries and other projectssupporting GIS mapping inthe REBYC-II CTI Countries.

4. Process

Workshop

Each Member Country provided information on their National Resources Mapping activities not only through GIS but also other methods used, e.g. Resource mapping byParticipatory Rapid Appraisal (PRA), Rapid Rural Appraisal (RRA), or others. Discussion focused on the way forward for developing mapping capacity in the REBYC-II CTI countries.

Training methodology

Participants learned about the 'location and coordinate system' and gained more understanding on the topic through participation in practical sessions. An introduction to Geographic Information System (GIS) and data models was provided. Participants also had the opportunity to practice mapping techniques using open-source GIS Software "QGIS" from installation to creating and editing data. Participants also learned how use GIS in data analyses and were able to practice using QGIS for data analysis and map production. In order to assign exercise to each trainee, individual computers were required for the training course. Application programs and special techniques were downloaded from http://www.qgis.org/en/site/about/index.html

5. Date and Venue

- The Workshop on Application of resource mapping was held on 29thSeptember 2014
- Training on Geographic Information System (GIS) ran from 30thSeptember to 3rdOctober 2014

The Venue for the workshop and training was the 3rd floor of the Main Building at BalaiBesarPenangkapanIkan (BBPI), Semarang, Indonesia.

6. Summaries of current status of GIS use in the REBYC countries

6.1. Indonesia

The Indonesia representative presented the information on Indonesian marine and coastal fisheries showing the designation of 11 areas with individual code numbers.

REBCY-II CTI Indonesia focuses on the enforcement of existing regulations, mapping gear use, development and implementation of the Arafura Management plan and participatory approaches with fisheries stakeholders for the collection of data for updating resource mapping. The Ministry of Marine Affairs and Fisheries (MMAF) has already developed, published and distributed hardcopies of Guidelines for Resource Mapping in order to improve the quality of data for responsible agencies

involved in fisheries management. There is a Geographic Information Agency in Indonesia to develop improved information and data management e.g. observer onboard program and vessel monitoring system (VMS) and under the Arafura Sea Management Plan.

The representative from Indonesia showed fishing activities mapping done through the interactive online application *Inageoportal*showing data obtained from the observer onboard program and VMS around fishing grounds off SorongProvince in 2012.

The difficulty in Indonesia has is how to effectively encourage local fishers to participate and provide information for the updating of data. In order to encourage the relevant agencies and working groups to engage more in data mapping work, a REBYC-II CTI National Working Group Meeting was organized in parallel with the Workshop and Training course on Resource mapping and GIS.

Under the REBCY-II CTI Project, Indonesia has future plans for collaboration on Resource Mapping for data sharing and the production of thematic information on fishery and marine environments for trawl fisheries management in the Arafura Sea. Future resource mapping techniques in Indonesia will utilizethe active participation of stakeholders. Future training needs include:preparation and arrangement of thematic data and information using GIS; and workshops to evaluatefishery and marine environmental conditions in the Arafura Sea; as well as map production and distribution.

6.2. Papua New Guinea

The Papua New Guinea (PNG) representative presented information on BRDs/TEDs trial road map that AFMA and CSIRO (Australia) are proposing to be used to develop a bilateral agreement to assist NFA (technically and financially for BRD and TED trials). The National Fisheries Agency (NFA) hascome up with a pre-trial document mapping plan over a one year period, beginning early in 2015. There is also an intention to produce an updated habitat map of the Gulf of Papua, and improved use of vessel logbooks, VMS data and the development of a bycatch database.

In future PNG intends to update the GOP resource map to include more species and habitat types. Habitat mapping may be possible in 2015under technical support from Australia and REBYC-II CTI project. With that, PNG may ask for technical assisting from RFU when all data set are complete, to develop resource mapping by QGIS techniques.

6.3. Philippines

The Philippines representative showed the result of a fishing position mapping exercise in the Samar Sea through using the online application,Google Map®. Several categories of fishing gear were shown, e.g. stake trap, lift net, various type of gillnets, traps, bottom longlines, trawls, Danish seines(both municipal and commercial)and ring nets. Fishing operation and FADs positions were shown on the screen. The results show that many fishing activities overlap on the same fishing ground. This information is useful for exercises such as the fisheries management plans developed under E-EAFM training courses. In the Philippines, socioeconomic and gender participatory mapping exercises are planned at the end of 2014.

REBYC-II CTI Philippine has a schedule to organize a Workshop on Participatory Approaches and Socioeconomic and Gender Mainstreaming. Mapping of fisheries resource by using participatoryapproach is one of the outcome from theworkshop. REBYC-II CTI Philippine is planning to map with fishing gear, critical fishing ground mapping and fish larvae by map pointing by marine survey and GPS. Needs of Philippines to develop resource mapping are training course on basic and advance GIS training.

6.4. Thailand

The representative from Thailand presented an overview of the activities related to trawl fisheries in Thailand done under the REBYC-II CTI project. Also some general information, including some statistics on trawl fisheries i.e. number of trawler, landing catch, production etc, was presented Thailand also provided information on new fisheries management measures such as on closed seasons

and areas in the Upper Gulf of Thailand that they will start piloting later in 2014.

Regarding the DOF Project for Vessel Monitoring Systems (VMS) in Thailand,the project has a voluntary cooperationwith 100 fishing boats:i.e. fifty two (52) trawlers, twenty five (25) purse seines, eighteen (18) cast netters, three (3) gillnetters and two (2) Push netters. Qualification for these fishing boat is that they must be Thai registered; commercial (LOA more than 14 meter) and have applied license of fishing boat and fishing.

REBYC-II CTI Thailand has plans to identify critical fishing ground in Trat Province and to use resources mapping analysis of data of fish larvae, water quality and socioeconomic survey collected as baseline information. By using GIS application, results can be efficiently presented to local stakeholders. Future support from SEAFDEC RFU includes organizing a workshop for analyzing the data set after collection has been completed.

6.5. Vietnam

The application of GIS in Viet Nam fishing management: Viet Nam uses applications for fleet management; identification of potential fishing zone; the design of fishing stations and the distribution of marine resources. The Project GIS of Viet Nam involving the Development Department of Technology and the Department of Fisheries Viet Namstarted in December 1995. The Project was named "Building geographic information system to serve the resource management and monitoring of marine resources KhanhHoa" and is implemented by the Ministry of Science Technology and the Environment. The Project difficulties were that: the data was only collected from a small number of ship;the ships disputed the line signal; communication was difficult in distant waters, severe weather affected implementation; and the reliability of the device has still not been fully tested.

One of the purposes of the 'Observing System fishing vessels, fishing areas and fisheries resources by satellite technology - MOVIMAR" (Project MOVIMAR), involving cooperation between France and Viet Nam, was to identify marine fishing zones. Three thousand (3,000) fishing vessels were selected based on the following criteria: Capacity of main engine 90 CV or more; operating in the waters of Viet Nam; must agree to be organized into teams with each fleet of vessels equipped with satellite connection devices; and fishing vessels fishing must be either tuna fishing, purse seining, trawling, gillnetting or some other specified gears.

Marine resource mapping has been used to illustrate the catch per unit effort at different design survey stations. Onboard observed data and satellite date were collection including species composition; chlorophyll density; surface temporal; landing data; fishing log data; fishing zone and time fishing. The representative from Viet Nam was not deeply involved in the REBCY-II CTI Project so could provide comments for future work. However, he was optimistic that resource mapping and application of QGIS could be used as a tool to manage data and present clearer results from the resource survey.

7. Training Sessions

Day 1 (30th September 2014)

In the first morning session, Dr. WiroteLaongmanee summarized the results of the pre-course assessment to the course trainees. He separated participants into two groups regarding their knowledge and skills using GIS and Quantum GIS. One group ranged from no experience to a fair degree of skill. The second group had good skills in using GIS and Quantum GIS.

The Course curriculum was explained to the trainees. "Introduction to Quantum GIS (QGIS)" was the first topic and consisted of: 1) basic concepts of GIS; 2) Other Geo-Informatics technology that had been used in fisheries science; 3) why we use QGIS; 4) the function of QGIS in analysis; 5) location by satellite systems; 6) Basic concepts of GPS system; 7) Geographic Coordinate System (GCS); and Cartesian Coordinate System (CCS).Before the end of the morning session, Dr. WiroteLaongmanee exchanged information with the trainees on the coordinate system to beused whichdepended on

thearea of the participant 's work, scale, and network. Theseare criteria to consider when deciding to use coordinate systems in the GIS work.

The afternoon session was a practical session lead by Dr. WiroteLaongmanee and assisted by Ms. Siriporn Pangsorn. Trainees practiced GPS recording by positioning 5 stations on earth for creating point, line, and polygon data in a GIS map. All trainees were assigned to record 5 points of a polygon with plot 10 replicates. The interval time to record in each replicate was 10 seconds. The participants then inputted all position data into a spreadsheet to calculate the average and standard deviation of Latitude and Longitude. After that, they practiced coordinate conversion from GPS coordinates to decimal units by using a spreadsheet. It is recommended that computer software is most compatible with decimal data. Before the end of 1st day, the participants learned how to download and install QGIS and the basic functions and menus in the software, before practicing over the following days.

Day 2 (1st October 2014)

The 2nd day lecture session focused on Geographic Information System and Data models. Dr. Wirote presented the concept of data in GIS. He explained the two groups of data models in GIS, i.e. spatial data (vector and raster) and attribute data. In GIS, both groups of data are necessary. Experience in the inputting of data into GIS suggests that the vector data model of points, lines or polygons depend on the scale of work. Advantages and disadvantages of each data model were explained.

In the afternoon practice session, trainees were assigned to utilize the data from Day 1. In order to generate points, connect to lines and finally create polygons in the QGIS. The participants then learned how to edit and update data in QGIS. After finishing their own data exercises, the trainees worked with SEAFDEC data to generate survey stations and create shipping routes, editing and updating attribute data were necessary. The final session was a practical session on Geo-referencing data for analysis in QGIS.

Day 3 (2nd October 2014)

The 3rd day lecture session focused on basic spatial analysis tools in GIS. Database tools, Grid-based and Image processing and terrain analysis. Data set queries that can generate sets of questions related to GIS data sets(e.g. Which roads are paved?) by using Structured Query Language (SQL). The lecturers also explained how to used basic statistics, buffering functions, overlays, reclassification, network analyses and surface analyses.

In the practical session, trainees were assigned to work with attributes tables, to query the data, how to carry out field calculations and data analyses functions. The participants also practiced how to generate appropriate buffers for an example given on how to use GIS in fisheries management planning. The Trainees also practiced map-making and prepared results of their work in GIS mapping.

In the evenings, participants were asked to make a map of their own data that composed of 1) the national boundary, 2) the type of point data, 3) a chart of the point data, 4) Name of the map for copyright and 5) Exporting the map to a PNG format. All trainees were requested to send their homework to the trainers for evaluation.

Day 4 (3rd October 2014)

The final day of the training focused on the homework evaluation and the conclusions and evaluations from the course. The organizers convened the closing ceremony and presented certificates of the training course to all trainees. In the afternoon the organizers arranged sightseeing activities for all participants.

8. Annexes

Annex 1: List of Participants

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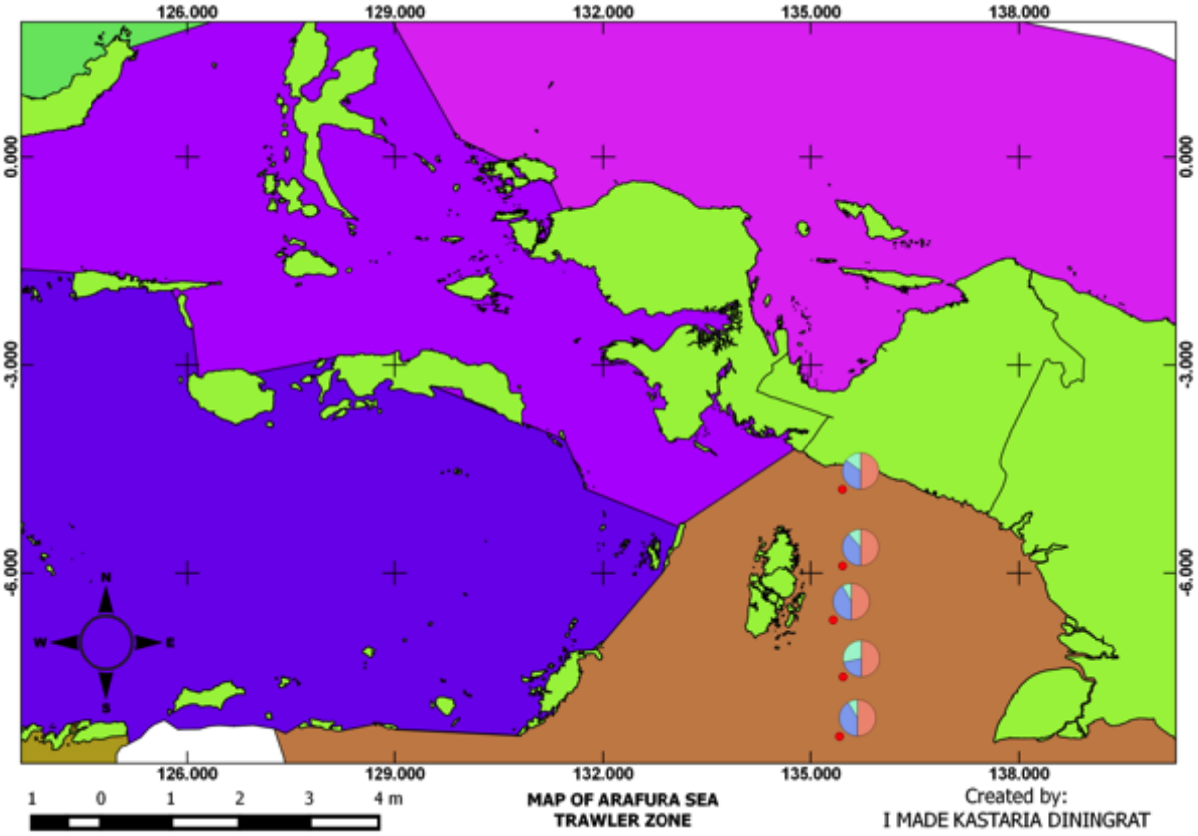
Annex 2. Workshop and Training Schedule

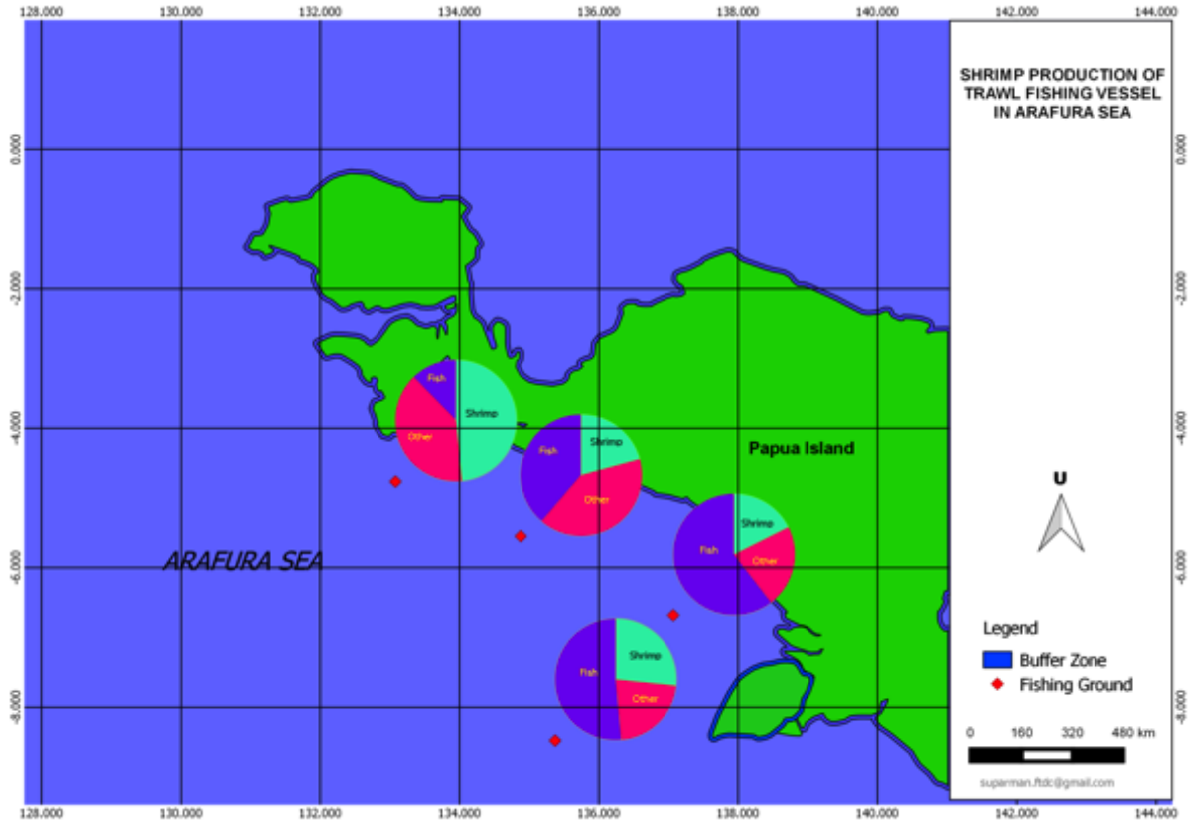
Time	Program	Facilitator
	Day 1 (29thSeptember 2014)	
08:30 - 09:00 0900	Registration Welcome and logistics of the workshop ▪ Background, objectives and expected outputs of the workshop (Mr. Isara) ▪ Keynote Speech by National Project Coordinator of REBCY-II CTI Indonesia (Mr. Endroyono) ▪ Opening of the meeting address by BBPI Director ▪ Introduce all participants ▪ Group Photo	Ms. Nathacha Organizer
10.00-10.30	Refreshment Break	
10:30-11:00 11:00-12:00	Adopting of the agenda and Introduction to the Workshop Project pilot area/site management plans: Sharing of experience from country of existing Resource Mapping for the management of their trawl fisheries (National initiatives) 1) Indonesia presentation 2) Papua New Guinea presentation	Mr. Isara Participants
12:00-13:00	Lunch	
13:00-14:00	Project pilot area/site management plans: Sharing of experience from country of existing Resource Mapping for the management of their trawl fisheries (National initiatives) 3) Philippines presentation 4) Thailand presentation 5) Viet Nam presentation	Participants
14:00-14:30	Presentation: Resource mapping, lessons learnt from SEAFDEC project	Ms. Siriporn P.
14:30-15:00	Presentation: Lesson leant of Shorted neck clam resource mapping by qualitative and quantities resources	Mr. Isara Ch.
15:00-15.30	Refreshment Break	
15:00-15:30 19:00	Wrapped up day 1 Welcome Dinner hosted by REBCY-II CTI RFU	Ms. Siriporn P. Dr. Wirote L.
	Day 2(30thSeptember 2014)	
08:30-12:00	Introduction on QGIS Lecture - Location by satellite system - Coordinate system	Dr. Wirote L. and Ms. Siriporn P.
12:00-13:00	Lunch	
13:00-17:00	Practice on - GPS Recording - Point - Line - Polygon - Coordinate conversion using spreadsheet - Quantum GIS installation and Working with QGIS	
	Day 3(1st October 2014)	
08:30-12:00	Lecture on Geographic Information System and Data	Dr. Wirote L. and

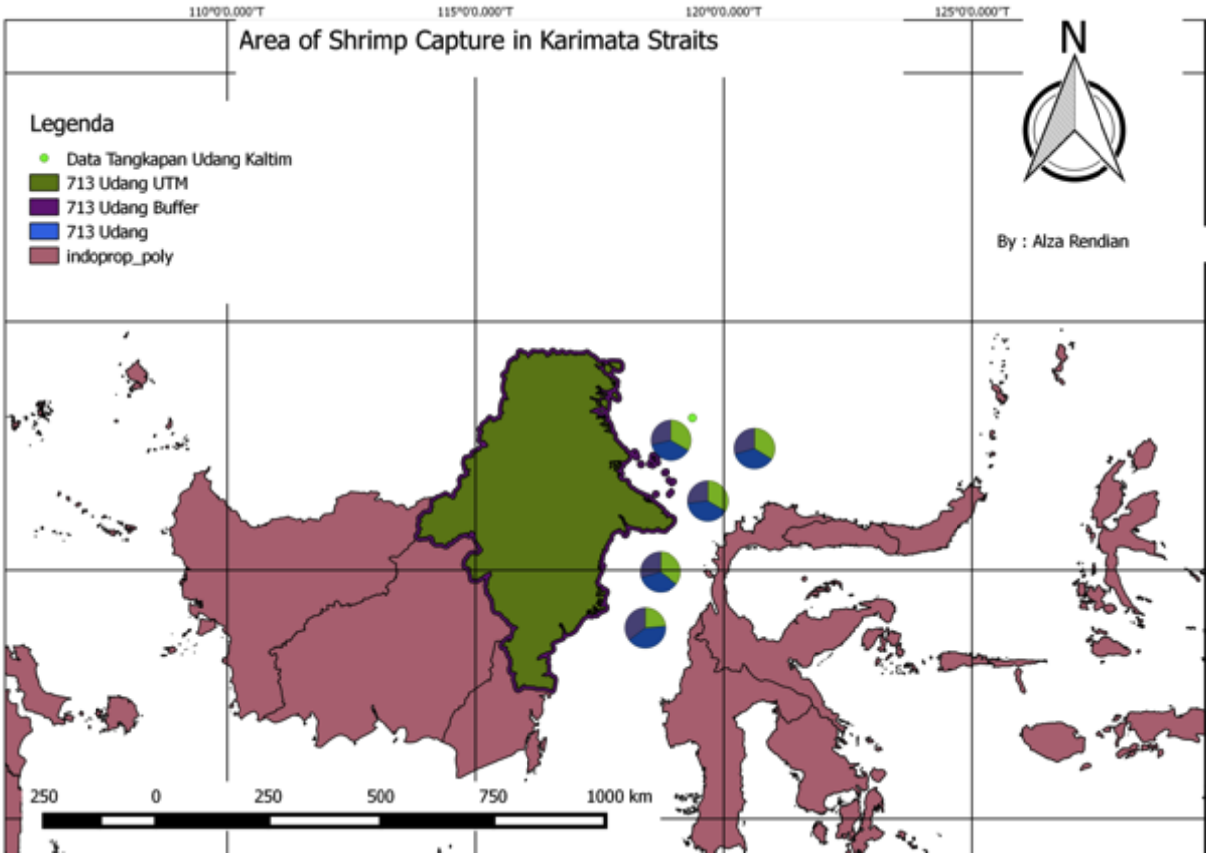
Time	Program	Facilitator
	models	Ms. Siriporn P.
12:00-13:00	Lunch	
13:00-17:00	Practice on - Editing / update data in QGIS - Create data in QGIS	
	Day 4 (2nd October 2014)	
08:30-12:00	Lecture on Data analysis in GIS	Dr. Wirote L. and Ms. Siriporn P.
12:00-13:00	Lunch	
13:00-17:00	Practical - Working with attributes table, queries, field calculation. - Working with geo-processing tools. - Homework evaluation	
	Day 5(3rd October 2014)	
08:30-09:00	Conclusion and Evaluation	Dr. Wirote L. and Ms. Siriporn P.
0900-1000	Closing Workshop and Training	Director of BBPI Mr. Isara Ch.
12:00-13:00	Lunch	
13:00-16:00	Excursion	TBD

Annex 3. Mapping Exercises

Indonesia






110°0'0.000"T
115°0'0.000"T
120°0'0.000"T
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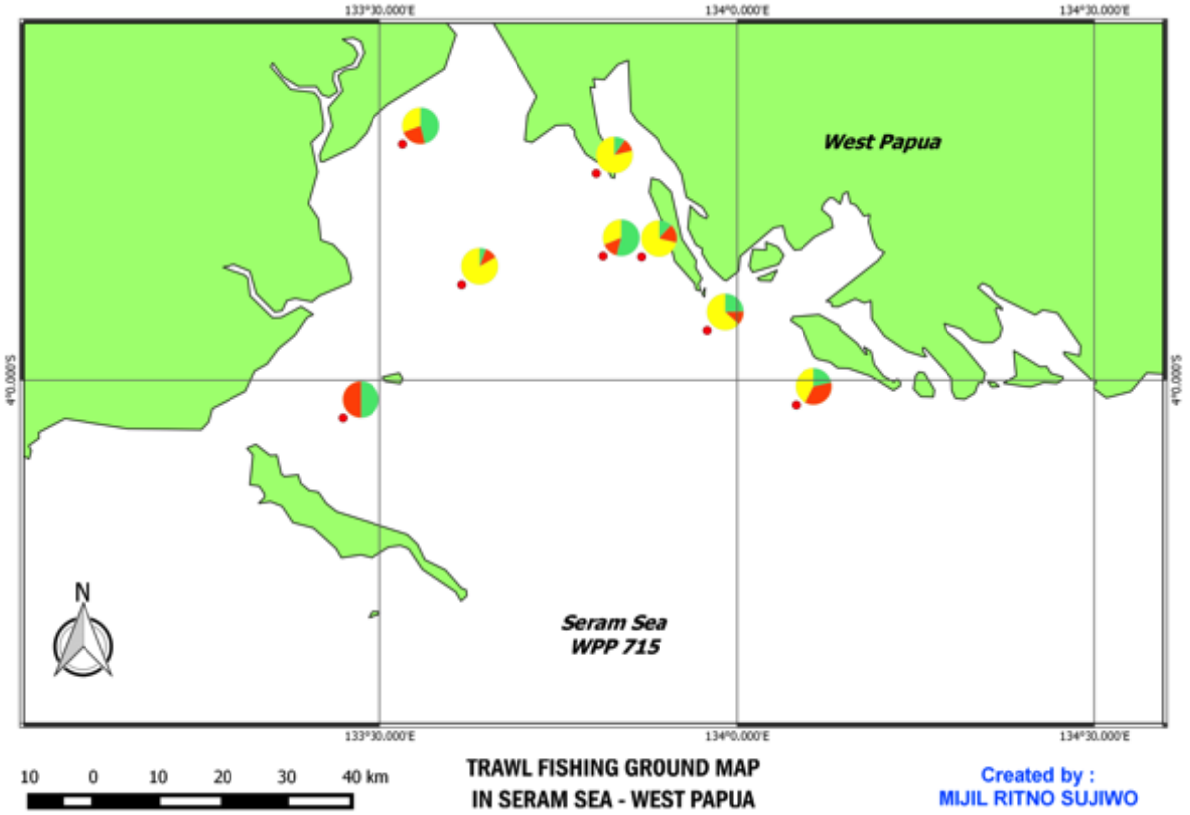
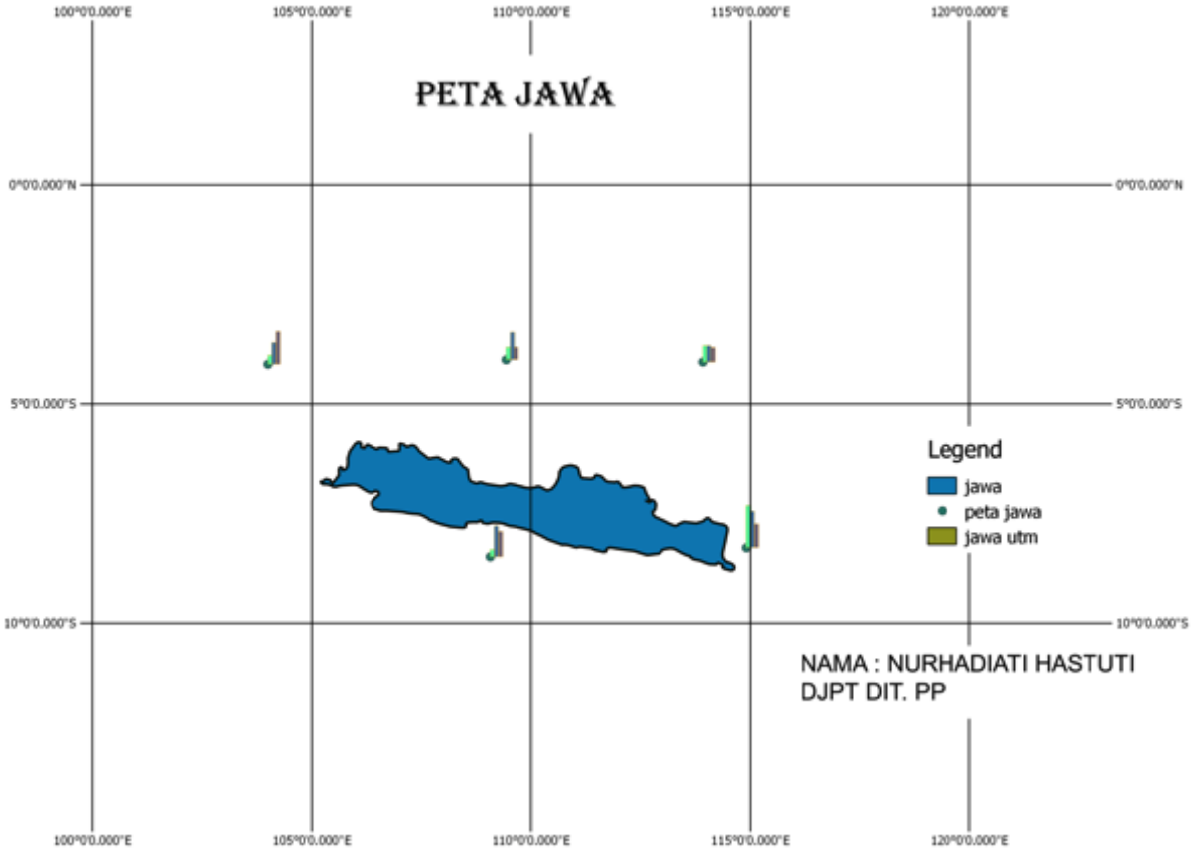
Area of Shrimp Capture in Karimata Straits
N
Legenda
Data Tangkapan Udang Kaltim
713 Udang UTM
713 Udang Buffer
713 Udang
indoprop_poly
By : Alza Rendian
250 0 250 500 750 1000 km


133°30.000'E
134°0.000'E
134°30.000'E
West Papua
4°0.000'S
N
Seram Sea
WPP 715
10 0 10 20 30 40 km
TRAWL FISHING GROUND MAP
IN SERAM SEA - WEST PAPUA
Created by :
MIJIL RITNO SUJIWO


PETA JAWA
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0°0'0.000"N
5°0'0.000"S
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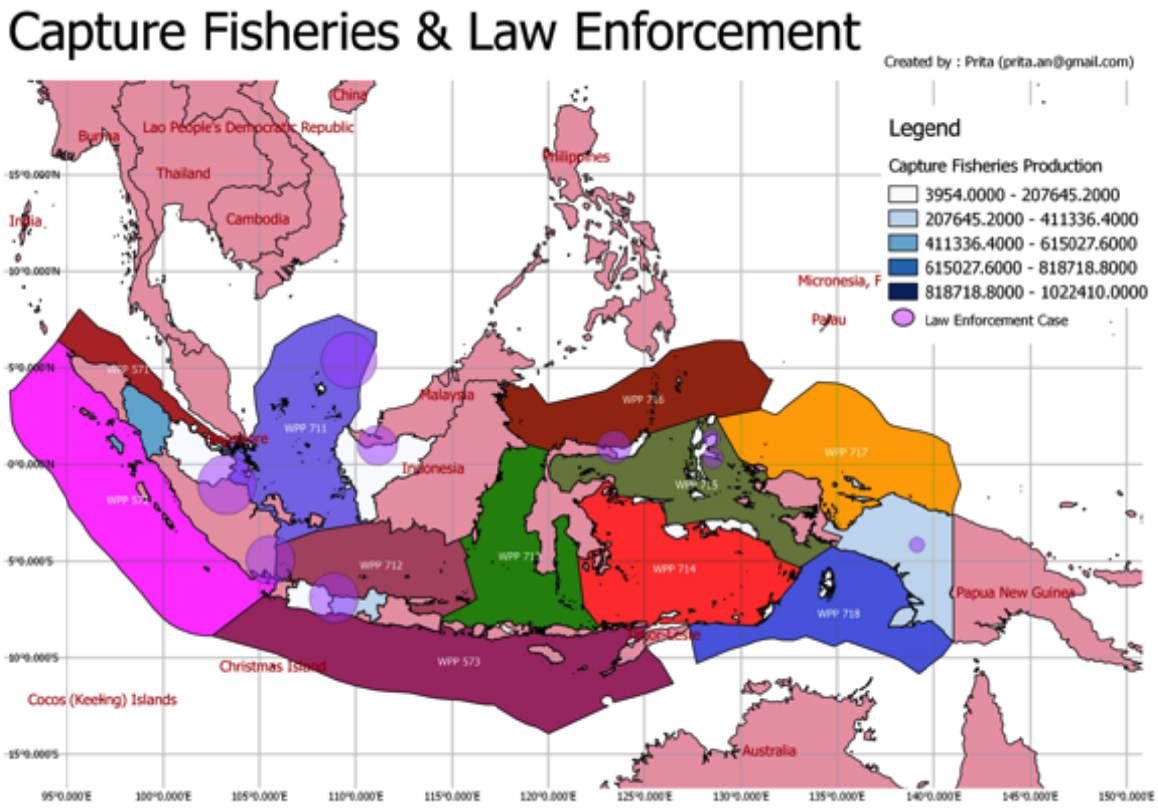
Legend
jawa
peta jawa
jawa utm
NAMA : NURHADIATI HASTUTI
DJPT DIT. PP


Capture Fisheries & Law Enforcement
Created by : Prita (prita.an@gmail.com)
Legend
Capture Fisheries Production
3954.0000 - 207645.2000
207645.2000 - 411336.4000
411336.4000 - 615027.6000
615027.6000 - 818718.8000
818718.8000 - 1022410.0000
Law Enforcement Case
China
Lao People's Democratic Republic
Thailand
Cambodia
India
Philippines
Micronesia, F
Palau
Malaysia
Indonesia
Papua New Guinea
Christmas Island
Cocos (Keeling) Islands
Australia
WPP 711
WPP 712
WPP 713
WPP 714
WPP 715
WPP 716
WPP 717
WPP 718
WPP 573
95°0.000'E
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105°0.000'E
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115°0.000'E
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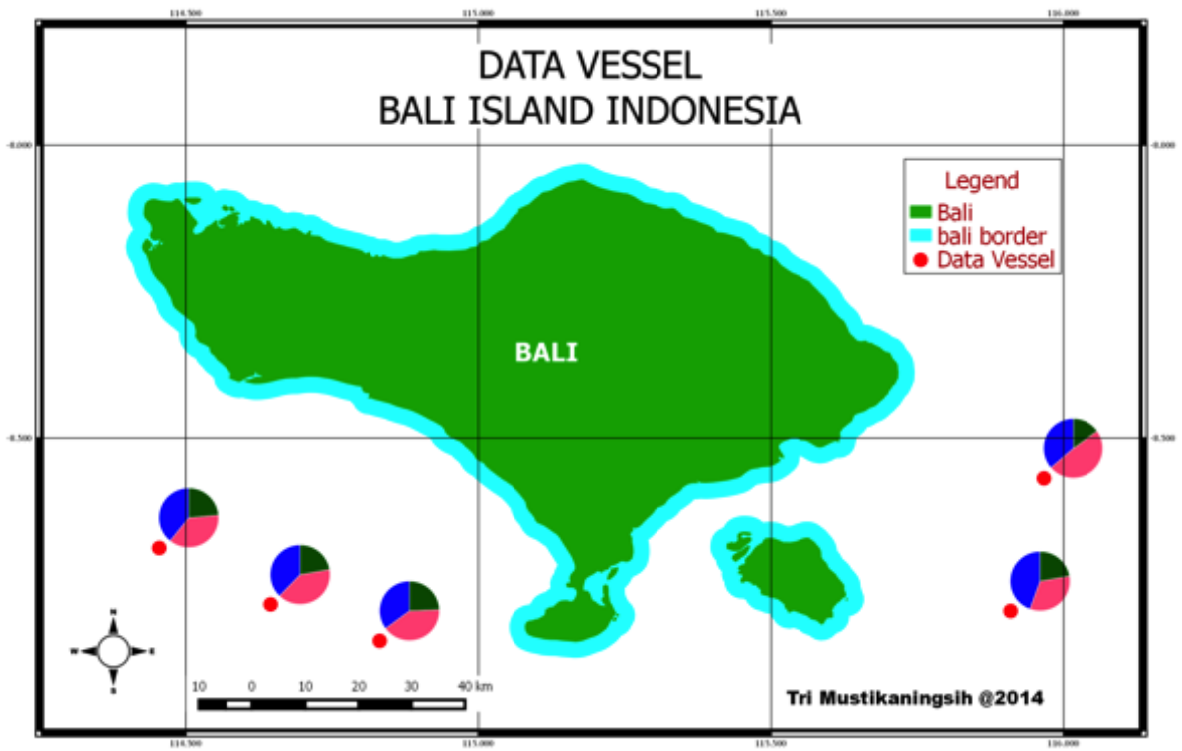
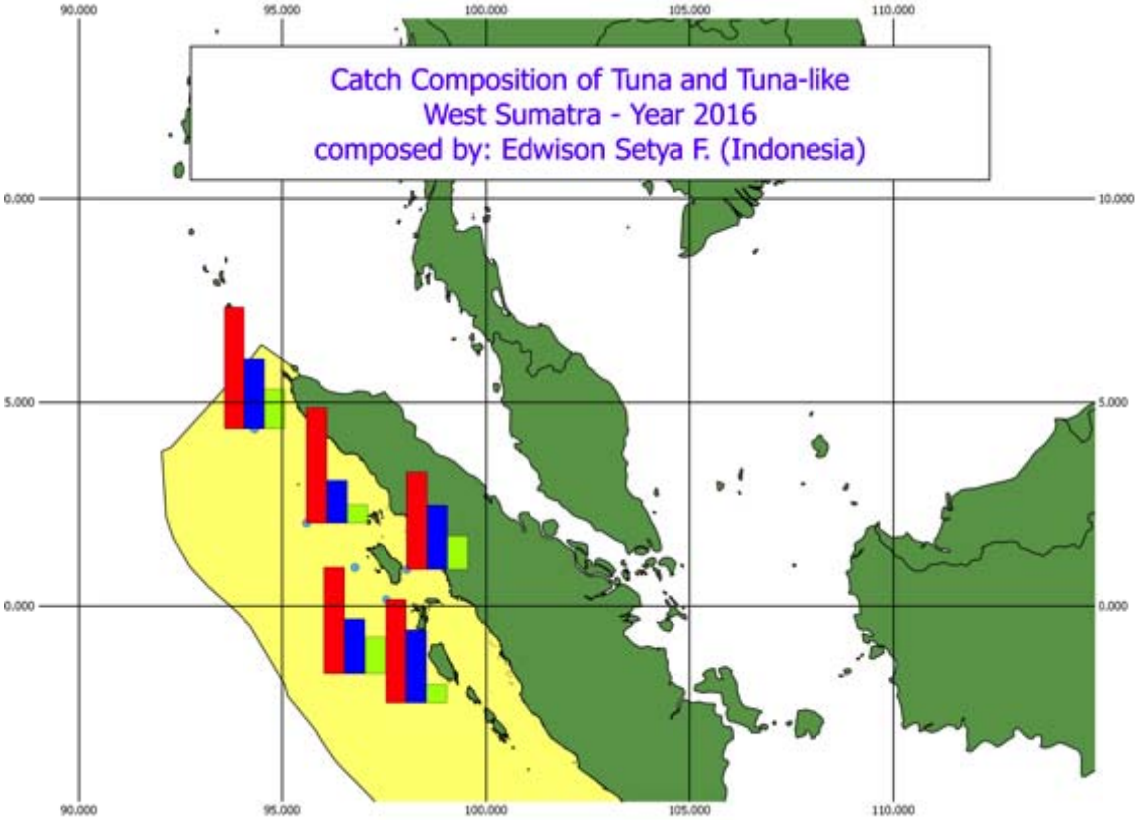
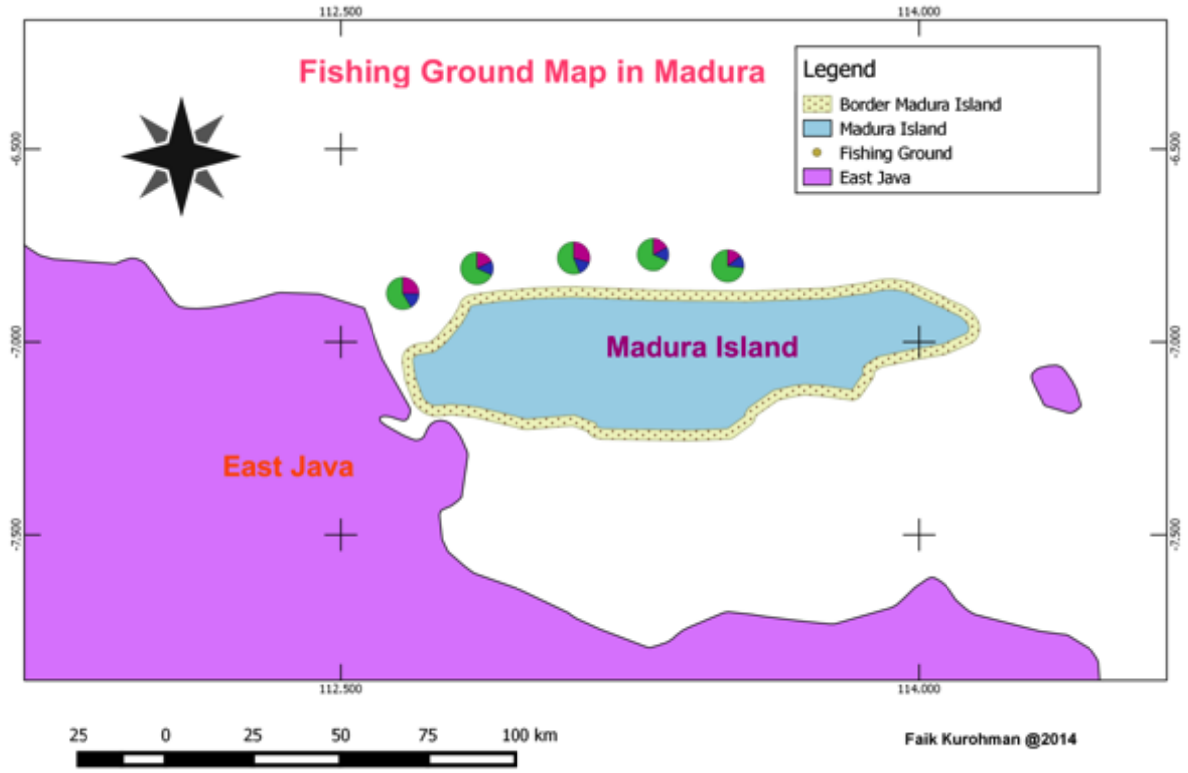
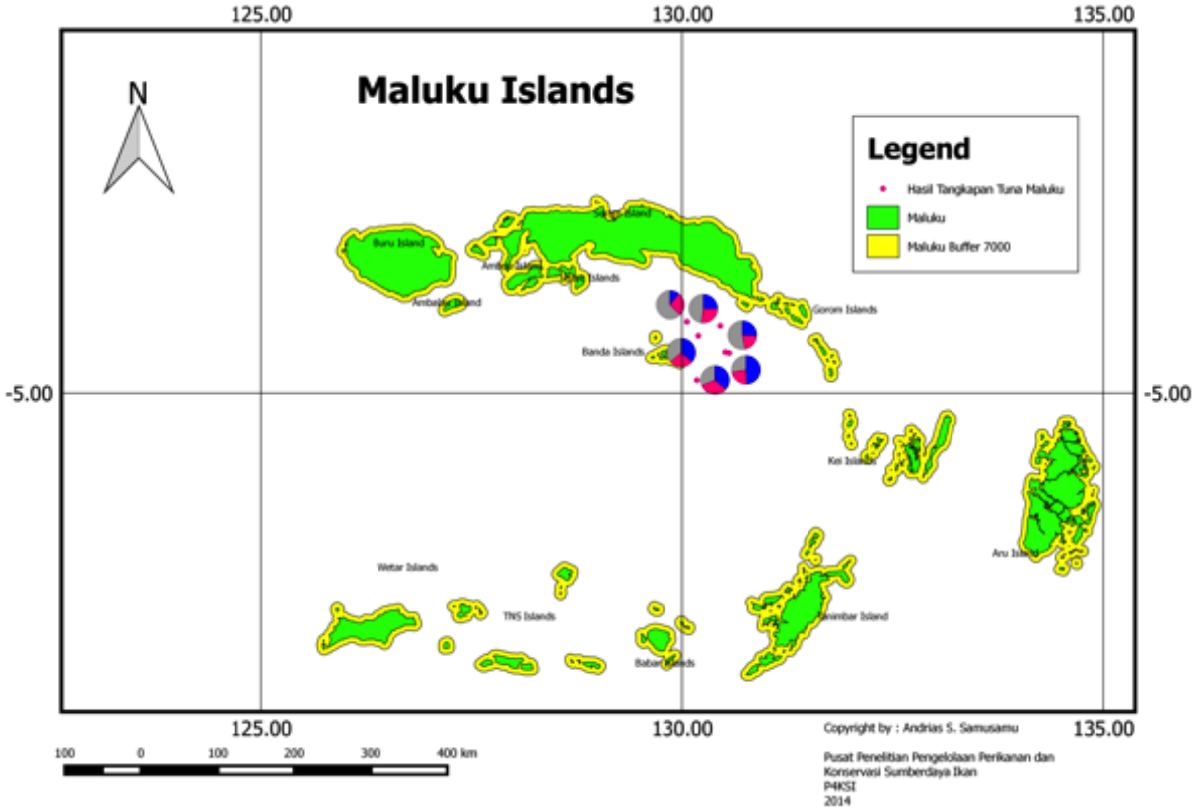
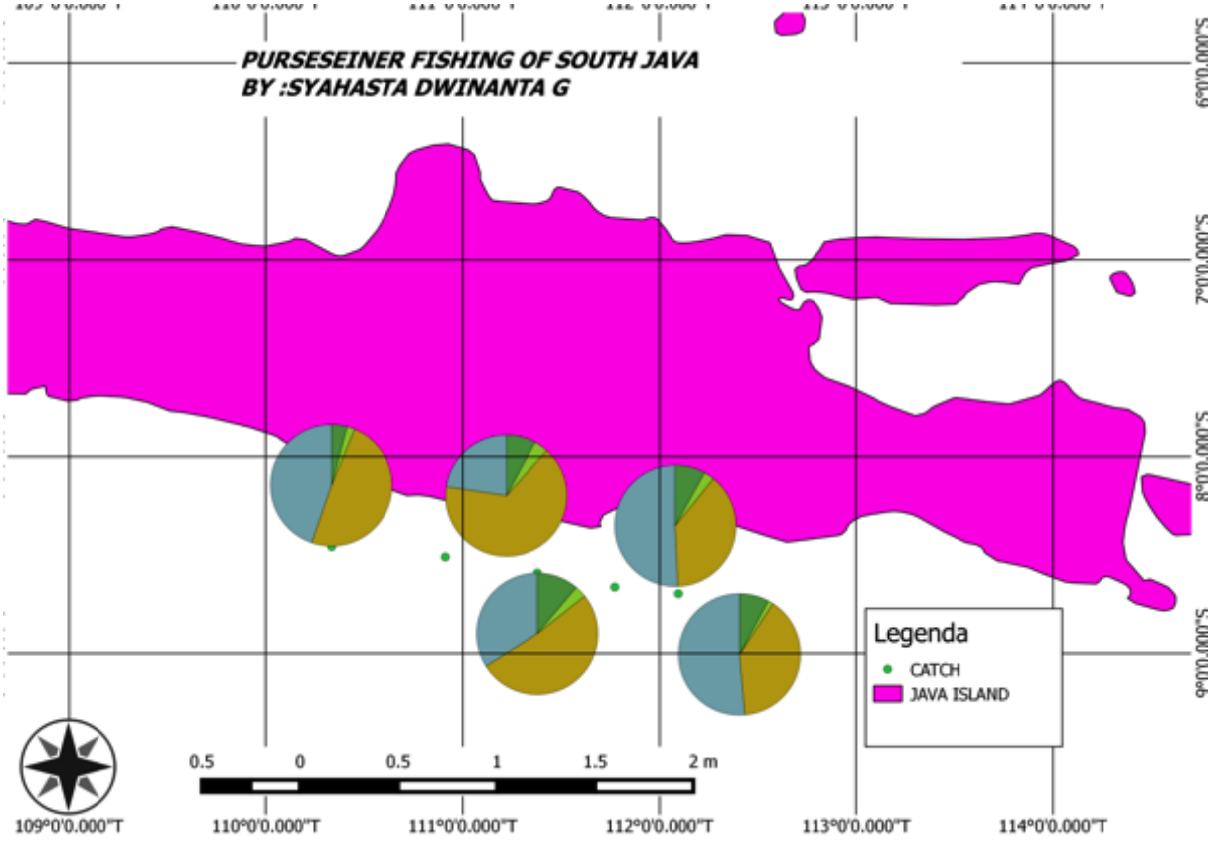

DATA VESSEL
BALI ISLAND INDONESIA
Legend
Bali
bali border
Data Vessel
BALI
10 0 10 20 30 40 km
Tri Mustikaningsih @2014

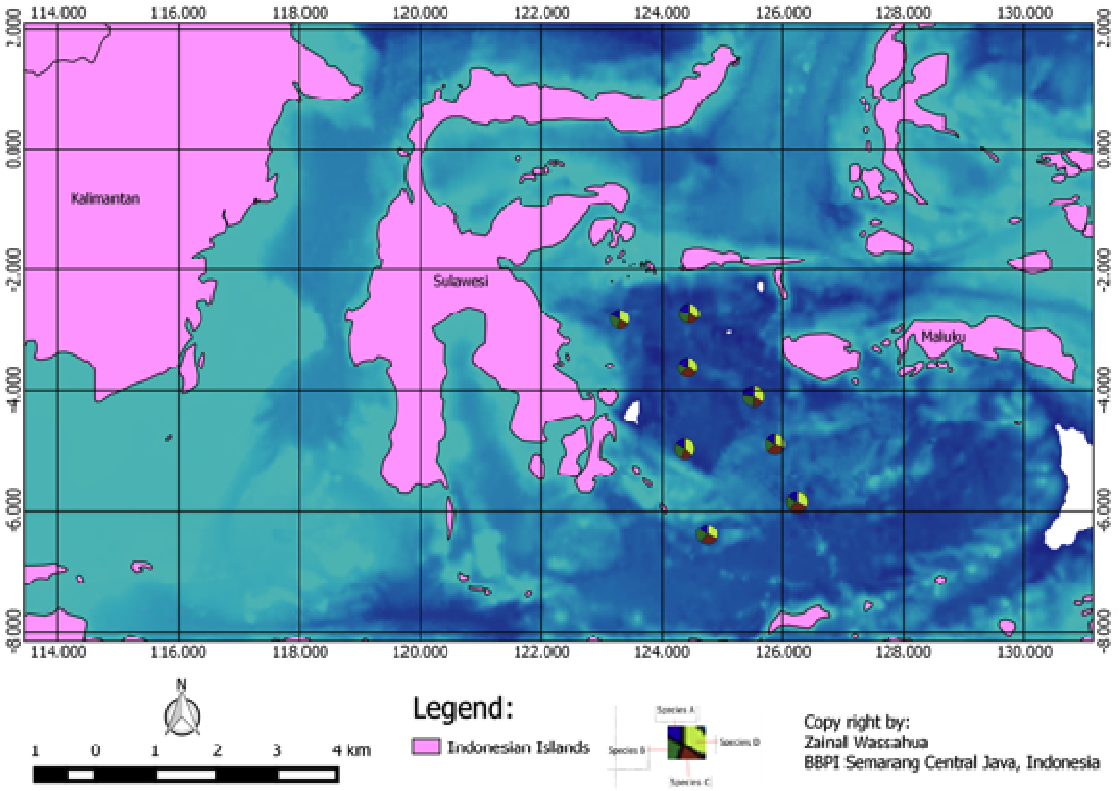

Catch Composition of Tuna and Tuna-like
West Sumatra - Year 2016
composed by: Edwison Setya F. (Indonesia)
90.000
95.000
100.000
105.000
110.000
10.000
5.000
0.000


Fishing Ground Map in Madura
Legend
Border Madura Island
Madura Island
Fishing Ground
East Java
Madura Island
East Java
112.500
114.000
-6.500
-7.000
-7.500
25 0 25 50 75 100 km
Faik Kurohman @2014

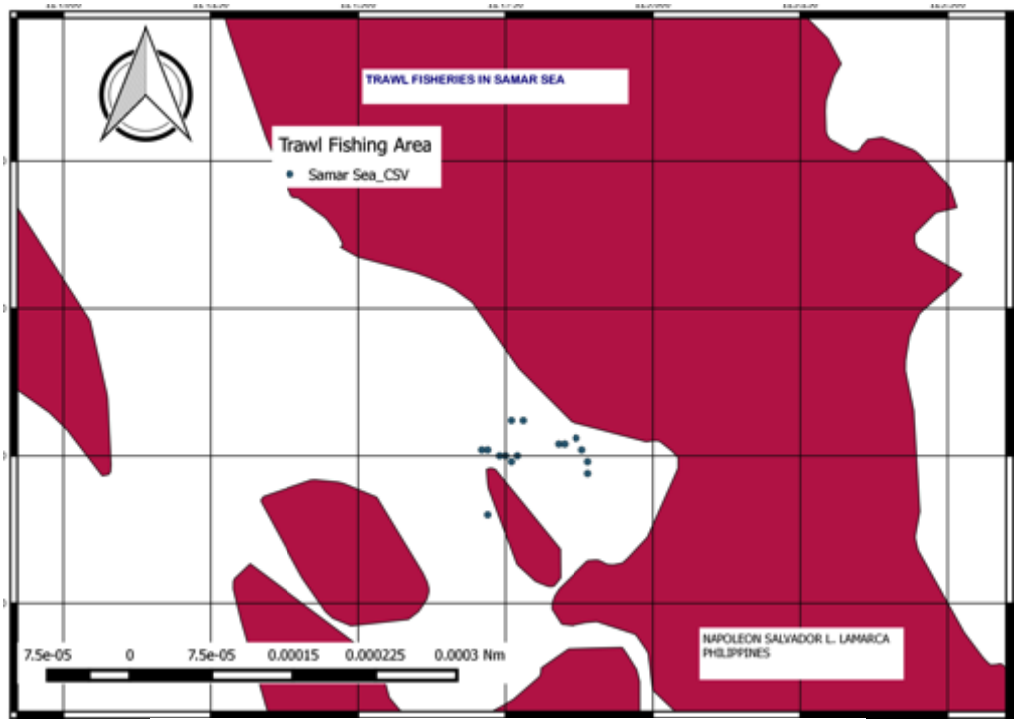

Maluku Islands
N
Legend
Hasil Tangkapan Tuna Maluku
Maluku
Maluku Buffer 7000
125.00
130.00
135.00
-5.00
Buru Island
Ambalau Island
Banda Islands
Gorom Islands
Kei Islands
Aru Islands
Wetar Islands
TNS Islands
Babar Islands
Tanimbar Island
100 0 100 200 300 400 km
Copyright by : Andrias S. Samusamu
Pusat Penelitian Pengelolaan Perikanan dan Konservasi Sumberdaya Ikan
P4KSI
2014

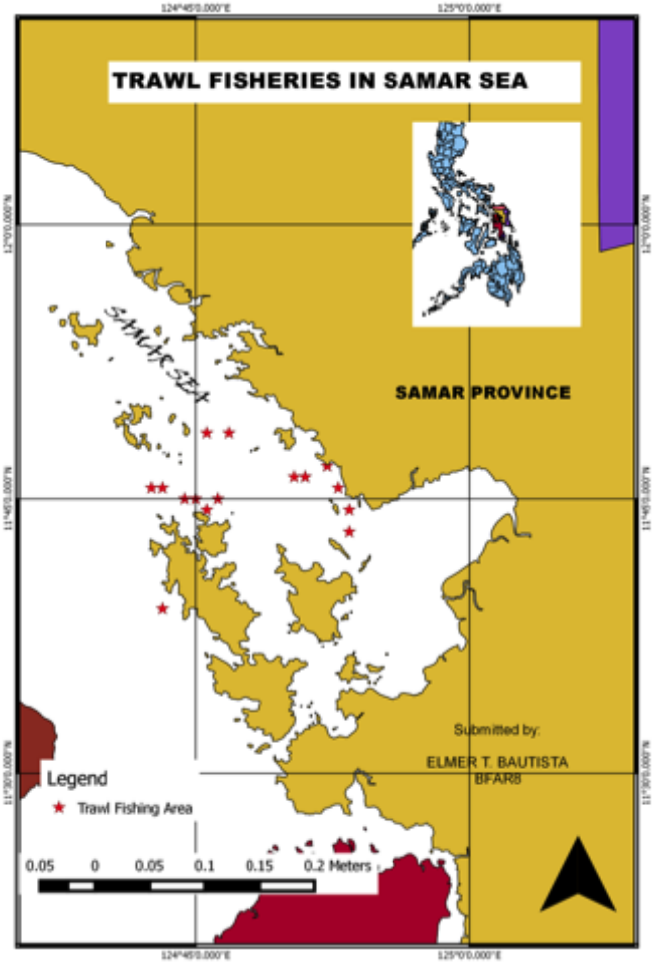


Location of Fishery Activity using purse seine to chath pelagis fish in Southtern Sulawesi

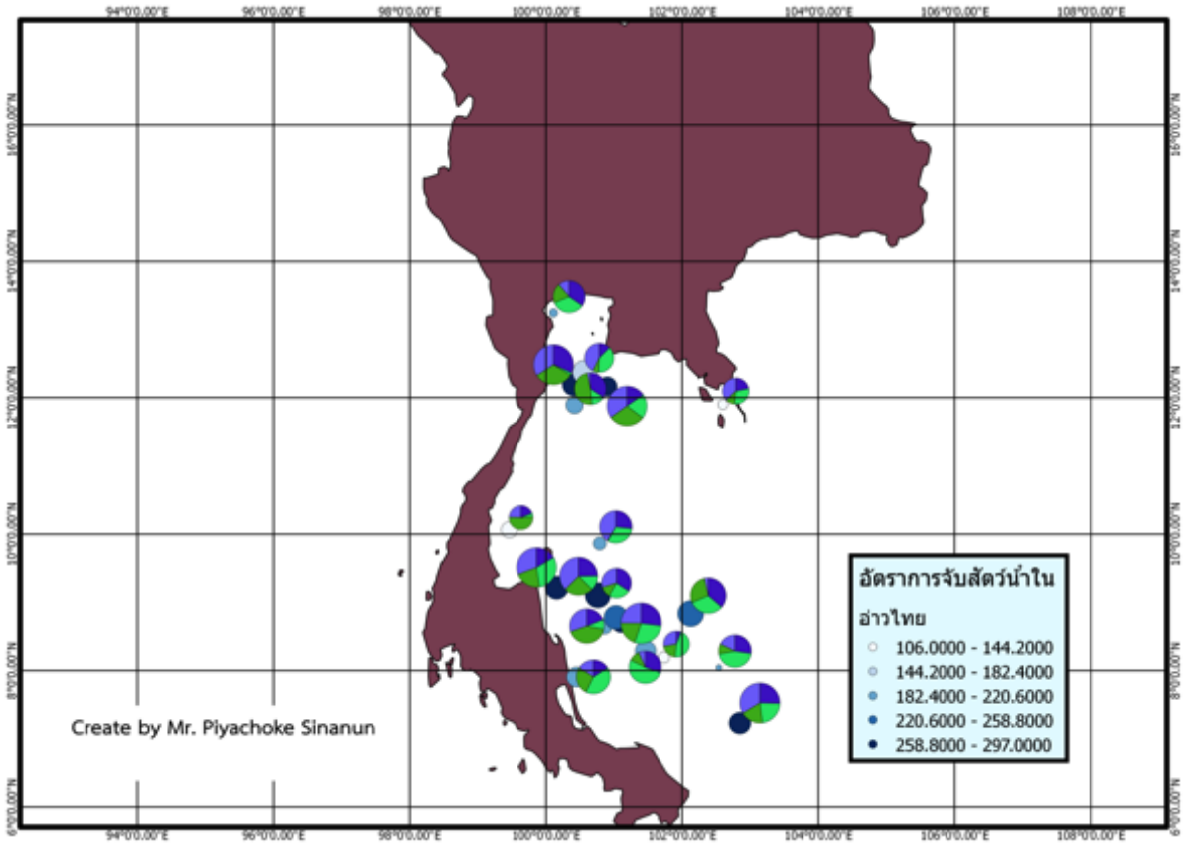


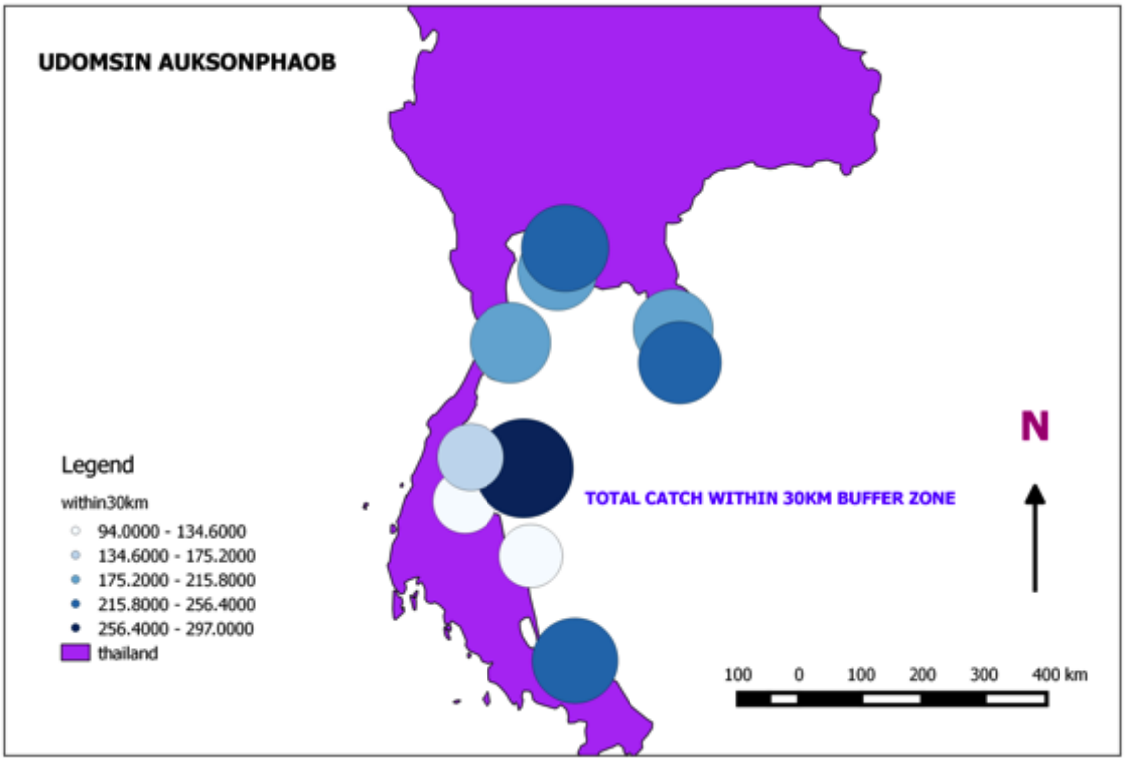
Philippines.



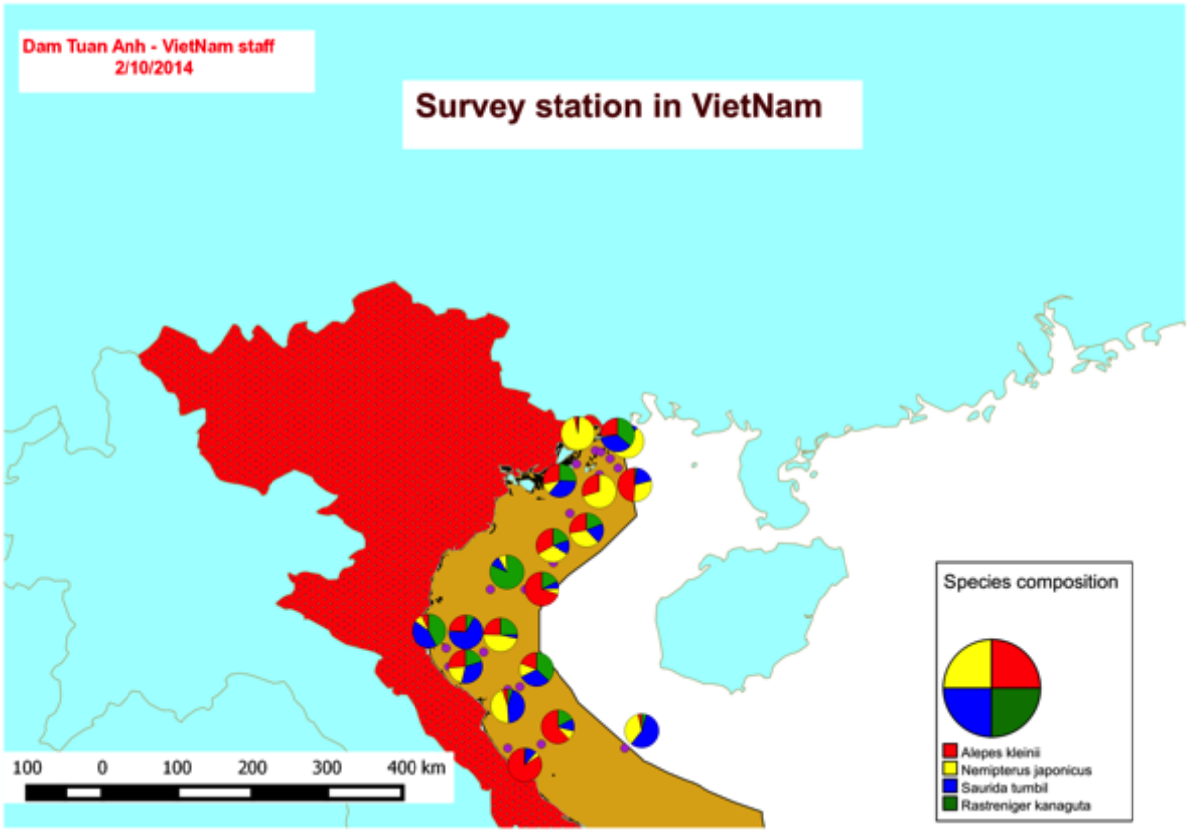


Thailand


อัตราการจับสัตว์น้ำใน
อ่าวไทย
106.0000 - 144.2000
144.2000 - 182.4000
182.4000 - 220.6000
220.6000 - 258.8000
258.8000 - 297.0000
Create by Mr. Piyachoke Sinanun


UDOMSIN AUKSONPHAOB
Legend
within30km
94.0000 - 134.6000
134.6000 - 175.2000
175.2000 - 215.8000
215.8000 - 256.4000
256.4000 - 297.0000
thailand
TOTAL CATCH WITHIN 30KM BUFFER ZONE
N
100 0 100 200 300 400 km

Vietnam


Dam Tuan Anh - VietNam staff
2/10/2014
Survey station in VietNam
100 0 100 200 300 400 km
Species composition
Alepes kleinii
Nemipterus japonicus
Saurida tumbil
Rastreniger kanaguta

Annex 4: Pre-course assessment results

Reflected by the pre-course assessment, total numbers of trainees that return the forms are twenty (20) persons.

About the experience in GIS field:nine (9) trainees are unskilled, nine (9) are fair while two (2) of them are good. Eight (8) trainees have never used GIS before, seven (7) trainees use GIS once a month and five (5) of them use GIS once a week. About the software that will use in this course "QGIS":eleven (11) trainees don't know about this, seven (7) trainees are fair, and two (2) of them are good in knowing QGIS. The trainees wish to get from this course are as follow:

1. To learn about example or lesson learned on GIS from REBYC II member countries.
2. To know, learn, obtain knowledge, basic definition, and principle on GIS and utilize it. Get a big experience about GIS
3. Good practice of QGIS, understand deeply about technical to use QGIS
4. Able to work with layer of several maps and connect it with the database (create, update, delete tables)
5. How to make a good descriptive map with graphs type of resources, upload excel files with GPS coordinates, and perform some common statistical displays.
6. Get the new tools GIS for spatial modeling and know how to use free open sources software for Geo-spatial analysis.
7. More environments and data collected well
8. In the context of GIS and fisheries management: how to apply GIS to fisheries and management; have a good experience mapping of Fishing management; able to plot, make line, square, etc. of GIS-based data to better manage trawl fishers in Indonesia.
9. How the GIS tools can create the habitat connectivity to develop Marine Sanctuary.
10. Get more information and learn about GIS for fishing ground mapping.
11. Understanding and using GIS for combating IUU fishing
12. Know the utilized and the benefit of this course for supporting in the operational fishing vessel, especially for fishing company.
13. Broaden network with all trainees including the organizer [SEAFDEC,GEF,FAO,CTI, and also MMAF]
14. About the topics of GIS training that the trainees wish to participate in the next stage are as follow:
15. Basic GIS training: the basic definition of technical of GIS like vector, raster, geographic coordination system, what type of data necessary for each type of research?
16. To know how to create digital map, how to process and overlay data until final image.
17. Application of more statistical analysis and produce better resource maps.
18. How to add geocoding information on QGIS.
19. Integrate PostgreSQL, Python, and QGIS
20. GIS database design and management
21. GIS web service, Web based GIS application (real time data online website)
22. Map the critical fisheries area in Southeast Asia Waters and also the potential area that can be explored equitably by all AMS.
23. Identified area of fishing catcher especially small scale fisheries and industries to avoid conflict.
24. How to model fishing management
25. How to forecast fishing ground

26. The usage and role of GIS to support sustainability and responsibility in fisheries
27. Marine Habitat Connectivity: Fishing Ground, Nursing Ground and Spawning Ground.
28. Integrated technology Remote Sensing, GIS, Acoustic and Modeling.

Summary from the pre-course assessment form

Question 1: what experience in GIS?

Skilled	Unskilled	Good	Fair
No. of trainees	9	2	9

Question 2: How often you work with GIS?

Skilled	Never	Once a month	Once a week	Everyday
No. of trainees	8	7	5	0

Question3: Do you know QGIS?

Skilled	Unskilled	Good	Fair
No. of trainees	11	2	7

Question4: What is your wish to get from this course?

1. To know GIS and principle of it
2. To learn, receive and having knowledge on GIS and utilized of it
3. Get a big experience about GIS and also broaden network with all trainees including the organizer [SEAFDEC,GEF,FAO,CTI, and also MMAF]
4. Understand deeply about technical to use QGIS and know the almost basic definition of GIS which the same in all GIS software
5. Able to work with layer of several maps and connect it with the database (create, update, delete tables)
6. How to make a good descriptive map with graphs type of resources, upload excel files with GPS coordinates, and perform some common statistical displays.
7. Get the new tools GIS for spatial modeling
8. Good practice of QGIS
9. How to use free open sources software for Geo-spatial analysis.
10. More environments and data collected well
11. Have a good experience mapping of Fishing management
12. Understanding and using GIS for combating IUU fishing.
13. How the GIS tools can create the habitat connectivity to develop Marine Sanctuary.
14. Able to plot, make line, square, etc. of GIS-based data to better manage trawl fishers in Indonesia.
15. Get more information and learn about GIS for fishing ground mapping.
16. Know the utilized and the benefit of this course for supporting in the operational fishing vessel, especially for fishing company.
17. How to apply GIS to fisheries and management
18. To learn about the fundamental of GIS and some example or lesson learn from REBYC II member country.

Question 5: What topic of GIS training will you wish to participate in the next stage?

1. Basic GIS training
2. To know how to create digital map

3. How to process and overlay data until final image.
4. The basic definition of technical of GIS like vector, raster, geographic coordination system, what type of data necessary for each type of research?
5. How to add geocoding information on QGIS.
6. Integrate PostgreSQL + Python + QGIS
7. GIS database design and management
8. GIS database and GIS web service
9. Web based GIS application (real time data online website)
10. Application of more statistical analysis and produce better resource maps.
11. Map the critical fisheries area in Southeast Asia Waters and also the potential area that can be explored equitably by all AMS.
12. How to forecasting fishing ground
13. How to modeling fishing management
14. Role of GIS to make sustainability and responsibility fisheries
15. The usage of GIS to support sustainability and responsibility fisheries.
16. Marine Habitat Connectivity -> Fishing Ground, Nursing Ground and Spawning Ground.
17. Integrated technology Remote Sensing, GIS, Acoustic and Modeling.
18. Identified area of fishing catcher especially small scale fisheries and industries to avoid conflict.

Annex 5. GIS End-of-course evaluation

From the evaluation process, eighteen (18) trainees had completely evaluated the Regional Workshop and Training.

Technical part:

Fifteen (15) trainees had evaluated that the Regional Workshop and Training was useful for them from some extent to extremely useful. Three of them did not reply in this question. The most usefulness topics were 1) practice on coordinate conversion using spreadsheet, and 2) practice on GPS recording (Point, Line, Polygon). And all the topics seem to be useful for their job perspective.

There are some topics that the trainees were missing during this training and would recommend to include in the future training course, all the topics are as follows:

1. Create data in QGIS
2. Practice on Geo-referencing raster data
3. Data analysis in GIS and QGIS: practice on working with data analysis function, attributes table, queries, field calculation; Analysis & Modeling processing; Data models; Query Builder for Analytical Tool
4. GIS database link to QGIS
5. Produce the map: showing information from the point in the QGIS map, displays additional information in each coordinate, how to add legend of pie chart in to map
6. The way to step to each step
7. GIS publish to web
8. Follow-up training on QGIS / Provision of instrument training program.

Based on the actual experience/learning that trainees had acquired from this training, they selected, in prioritized order, topics they consider to be the most useful from a job perspective.

The first prioritized topics was Geo-referencingthe raster data or image, they give the reason that this Geo-referencing raster data or image was important to analyze data and get a good base-map for the project.

The second prioritized were categorized in to 3 topics are 1) Data analysis: the reason were they can use for resource mapping and research work and it's very important as an input to make some policy by certain, 2) Create data in GIS: the reason were they could be motivated and give more opportunity to give commendation to other researchers, instructors as well as a policy makers, and 3) QGIS: the reason were this software is free and better to learn the new technology for use in job perspective.

The other topics were considered as the third prioritized, there were as follow:

1. Coordinate conversion with spreadsheet
2. Import the coordinate to GIS
3. GPS recording
4. How to join dataset and excel file to project
5. Working with attributes table, query, field calculation
6. Making the diagram, chart
7. Map making
8. Editing, modify and update GIS data

For course design and delivery part:

Course design:

The feedbacks from trainees, twelve (12) trainees commented that the period of this training was appropriate, four (4) commented that too short and one (1) commented that a bit too long. Training pace, eleven (11) trainees commented that the pace was appropriate, five (5) commented that fast, and one (1) commented that the pace was too fast. For the number of topic, thirteen (13) trainees though that the topics of this training was appropriate, one (1) commented that too few topics, three (3) commented that a bit too many.

And they give some comments for this training were this course was excellent but time is too short, they need more time in practice session because there are many deeply detail in each topic to learn and practice.

Course trainers:

The feedbacks from trainees to the 2 trainers were as follow:

Dr. Wirote L., thirteen (13) trainees though that his knowledge was excellent, and five (5) commented that his knowledge was good. For style and approach, nine (9) trainees though that he was good, seven (7) commented that he was excellent, and two (2) commented that he was fair. For preparation and organization, twelve (12) trainees though that he was good, and six (6) commented that he was excellent. For friendliness and responsiveness, twelve (12) trainees though that he was excellent, five (5) commented that he was good, and one (1) commented that he was fair.

Ms. Siriporn P., ten (10) trainees though that her knowledge was excellent, five (5) commented that her knowledge was good, and one (1) commented that her knowledge was fair. For style and approach, nine (9) trainees though that she was good, six (6) commented that she was excellent, and one (1) commented that she was fair. For preparation and organization, eleven (11) trainees though that she was good, and five (5) commented that she was excellent. For friendliness and responsiveness, eleven (11) trainees though that she was excellent, three (3) commented that she was good, and two (1) commented that she was fair.

And their comments were both trainers were good in knowledge and lecture but because of difference pronunciation of English, please delivered the lectures and messages clean and clear and sometime pace is too fast so they could not following and missing some point of lecture. Trainers might check the trainees that they finish the step of GIS working before proceed to next practice. Some question on working QGIS have not answer. Some of trainees hope to have more chance to work together with other trainees and must be improved in delivering materials. And more practice assistance person for faster to catch by participant.

Training methods:

The feedback from trainees to the training methods, twelve (12) trainees commented that the presentations were good, three (3) commented that presentations were excellent, and two (2) commented that presentations were fair.

Session of practical activities, thirteen (13) trainees though that practical activities were good, two (2) commented that were excellent, and two (2) commented that were fair. Session of group discussions and participation, thirteen (13) trainees though that practical activities were good, two (2) commented that were excellent, and two (2) commented that were fair. For other media and videos, eight (8) trainees though that other media and videos were good, eight (8) commented that were fair, and one (1) commented that were poor. For the quality of training materials, ten (10) trainees commented that quality of materials were good, five (5) commented that were excellent, and two (2) commented that were fair.

And their comments were in this training course had a technical language on QGIS they have to advise for a translator. Give more attractive presentation to make a fun discussion. Improve the quality of practice materials and also practice activities and training time. It would be very helpful if trainees hold the modules or guide book while trainer is teaching.

Administration:

The feedback from trainees to administration, logistic of the course resulted that nine (9) trainees though that there were good, and eight (8) commented that there were excellent. Only comment was concerned on the electricity blackout in during training activity.

Summary of the End-of-course evaluation

Part 1. What did you actually get from the training?

Question1: The overall usefulness of the training from your job perspective?
(1= not useful at all, 2= useful to little extent, 3= useful to some extent, 4= useful to large extent, 5= extremely useful).
Six (6) trainees though that this course is useful some for their job perspective, six (6) trainees though the course is useful to large and three (3) trainees though the course is extremely useful.

Question 2: Please score the following training course topics, as delivered, in terms of their usefulness to you from a job perspective: (use the same scale as in Q. 1 above)

Topic	**Score** (1, 2, 3, 4, 5)
Lecture on Location by satellite system	4
Lecture on Coordinate system	3
Practice on GPS Recording, Point, Line, Polygon	5
Practice on Coordinate conversion using spreadsheet	5
Practice on Quantum GIS installation and Working with QGIS	4
Lecture on Geographic Information System and Data models	3.5
Practice on Editing / update data in QGIS	4
Practice on Create data in QGIS	4
Practice on Geo-referencing raster data	3
Lecture on Data analysis in GIS	4
Practice on Working with attributes table, queries, field calculation	3
Practice on Working with data analysis function	3.5
Practice on Map making	4

Question 3:

Are there any particular elements/topics that you were missing in this training course and which you would recommend including in future training courses?

1. Create data in QGIS
2. Practice on Geo-referencing raster data.
3. Data analysis in GIS&QGIS
4. Practice on working with data analysis function, attributes table, queries, field calculation.
5. Analysis & Modeling processing, Data models
6. Query Builder for Analytical Tool
7. GIS database Link to QGIS
8. Displays additional information in each coordinate
9. Showing information from the point in the QGIS map.
10. How to add legend of Pie Chart
11. GIS Publish to web
12. Follow-up training on QGIS / Provision of instrument training program.
13. The way to step to each step.

Question 4:

Based on the **actual experience/learning** you have acquired from the training, please select, in prioritized order, **three topics you consider to be the most useful to you from a job perspective** and explain briefly why you find them useful (use the suggested list of topics from Q2 as guidance and add topics as needed).

Topic 1
Why useful?:

Part 2.Course design & delivery

Course design						
Course too short <	1	2	3	4	5	> Course too long
Pace too slow <	1	2	3	4	5	> Pace too fast
Too few topics <	1	2	3	4	5	> Too many topics
Please comment:						

1. There is must be prepare a guideline book for trainees. May lecture check is the participant have finish the steps of GIS working.
2. My suggestion is please trainer try to deliver the material clean and clear. I have some problem in first and second day. But finally I understand about some word that delivered especially from Mr. Wirote.
3. There are many deeply detail in each topic to learning and practice. So we should have more time to do that
4. We need more time for practice session.
5. Too short course. + In my opinion, This course have very short time
6. The course is excellent.

Course trainers Please rate each trainer according to each category: 1 = poor 2 = fair 3 = good 4 = excellent								
Name of trainer:	.....				.....			
Knowledge.....	1	2	3	4	1	2	3	4
Style & approach.....	1	2	3	4	1	2	3	4
Preparation & organization.....	1	2	3	4	1	2	3	4
Friendliness & responsiveness....	1	2	3	4	1	2	3	4
Please comment:								

1. Some question on working QGIS haven't answer, like: How to show data on chare?
2. I hope to have more chance we work together and all trainers should be one of the best teachers I have ever know.
3. Both trainers were great, but I think in the future there are some things that should improve, especially in delivering material.
4. The trainer has good knowledge and lecturing. But sometime the pace is too fast, so I can't following and missing the some point of lecture.
5. More practice – assistance person, I think will be faster to catch by participant.+More person of practice assistants will be more appreciated+Give more training assistant

Training methods

	Poor	Fair	Good	Excellent
Presentations ……..	1	2	3	4
Practical activities ……..	1	2	3	4
Group discussions and participation…	1	2	3	4
Other media/videos……..	1	2	3	4
Quality of materials ……..	1	2	3	4
Please comment:				

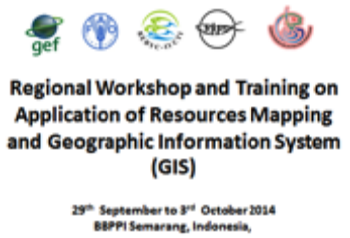
1. Because of technical language on QGIS, have to advise for a translator.
2. I think that the group discussion in day I waste the time a lot. If possible, next course should be cut down here.
3. Give more attractive presentation to make a fun discussion.
4. Please improve the quality of practice material and also practice activity. This is my first time to join the training and will interested to join again in the future if SEAFDEC will held this hand of training in other ASEAN country. A good moment to strengthen our relations to face ASEAN Economic Community in the end of 2015.
5. Improve the quality of the material and it's training time. + Improve the quality of the material and it's training time.
6. It would be very helpful if trainees hold the modules while trainer is teaching.+ need some copy of module to matery +Give module for training or copy Data presentation

Administration
How do you rate the service from the course administration staff? Poor < 1 2 3 4 > Excellent Please suggest improvements:

1. Collaborate on local administration with SEAFDEC
2. So far, so good and hopefully there is electricity blackout in the middle of training activity.

Annex 6Presentations

1. Introduction to Workshop



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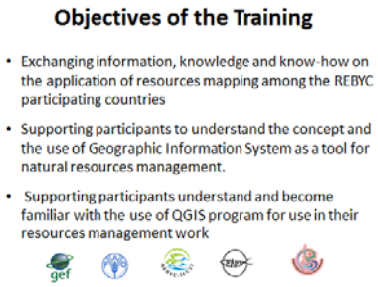

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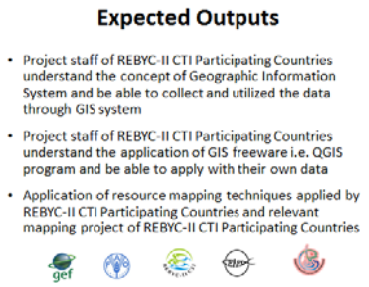

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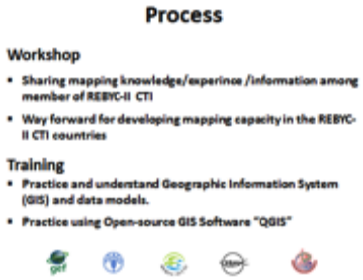

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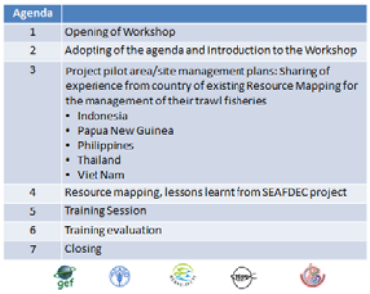

Agenda	
1	Opening of Workshop
2	Adopting of the agenda and Introduction to the Workshop
3	Project pilot area/site management plans: Sharing of experience from country of existing Resource Mapping for the management of their trawl fisheries • Indonesia • Papua New Guinea • Philippines • Thailand • Viet Nam
4	Resource mapping, lessons learnt from SEAFDEC project
5	Training Session
6	Training evaluation
7	Closing

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2 Indonesia Presentation

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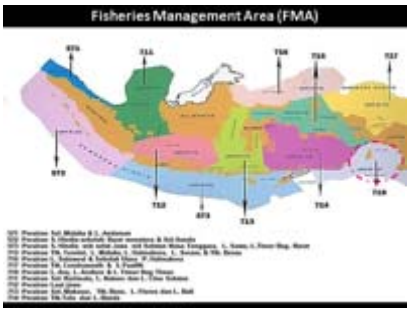

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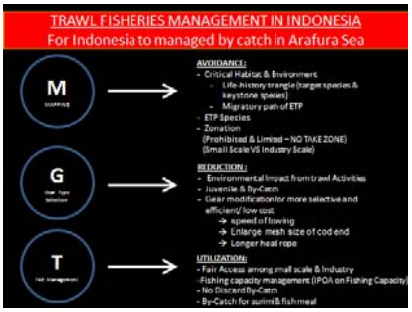

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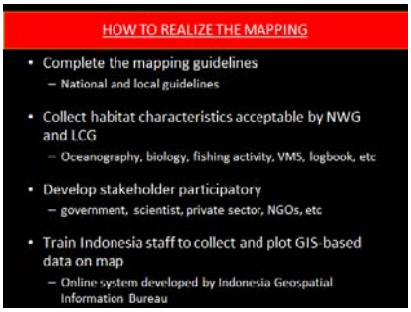

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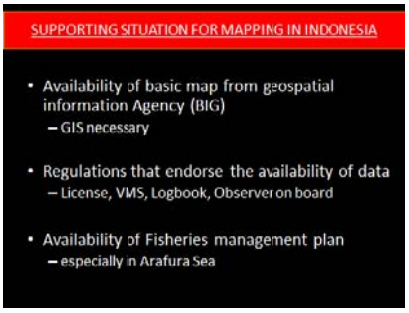

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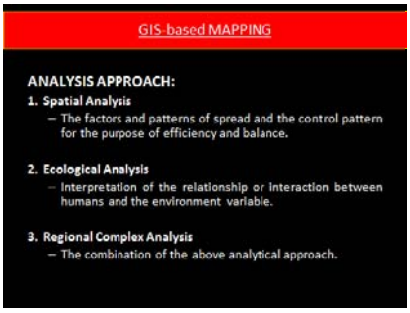

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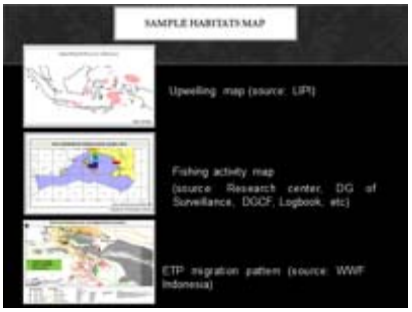

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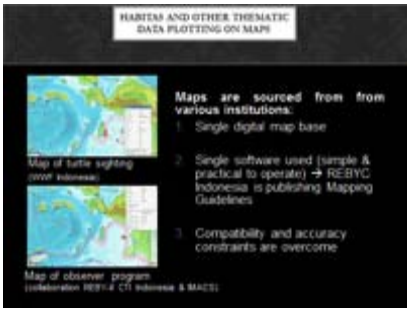

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3 Papua New Guinea

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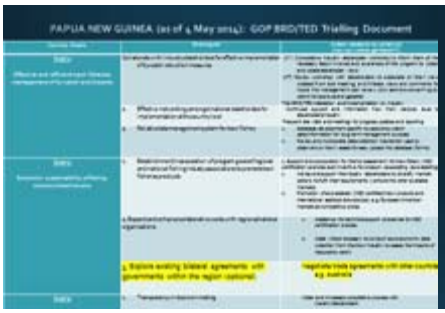

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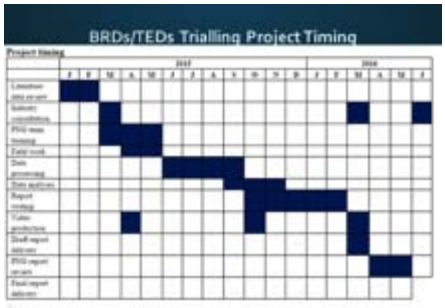

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4 Philippines Presentation

STRATEGIES FOR TRAWL FISHERIES BYCATCH MANGEMENT (REBYC II-CTI; GCP/RAS/269/GEF)

September 26, 2014

Gandara, Samar

(1)

PROJECT BACKGROUND

- FAO executing (GEF) agency
- Executing partners
  - Indonesia, Papua New Guinea, Philippines, Thailand and Vietnam
  - SEAFDEC is the Regional Facilitating Unit (RFU)
- Project duration
  - 4 years (2012-2015) actual implementation only started March 2013

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BFAR/FAO/GEF/SEAFDEC/ REBYC-II CTI PROJECT

WORKSHOP ON PARTICIPATORY APPROACHES AND SOCIO-ECONOMIC AND GENDER MAINSTREAMING

October 19-26, 2014

BFAR-RFTC8, Catbalolgan, Samar

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5 Thailand Presentation

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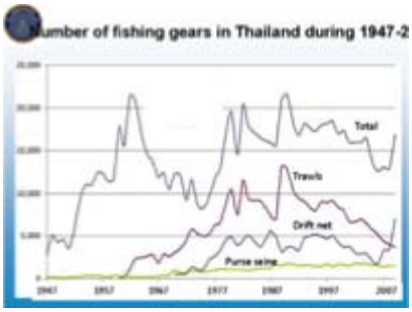

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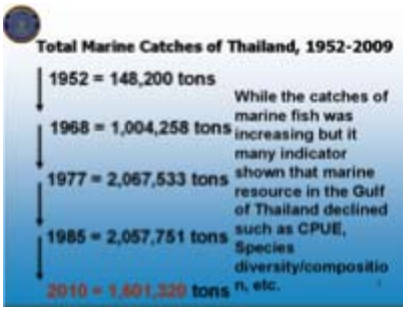

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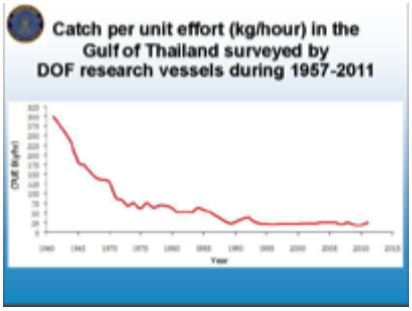

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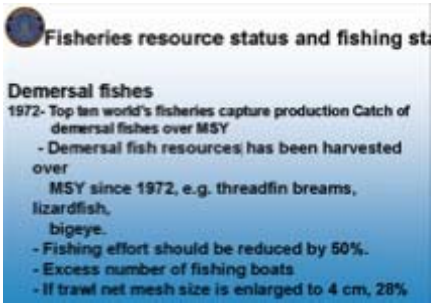

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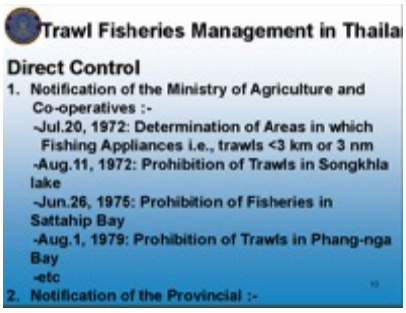

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6Viet Nam Presentation

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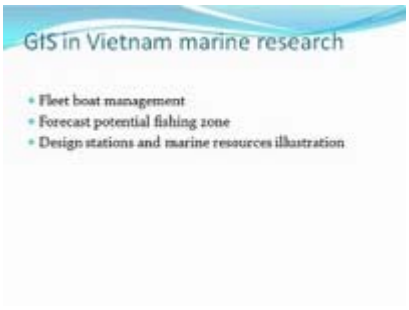

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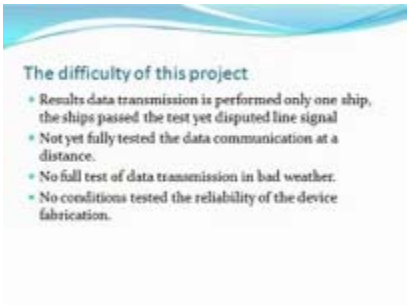

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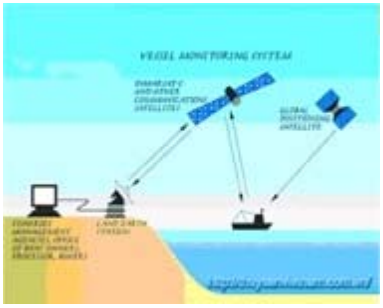

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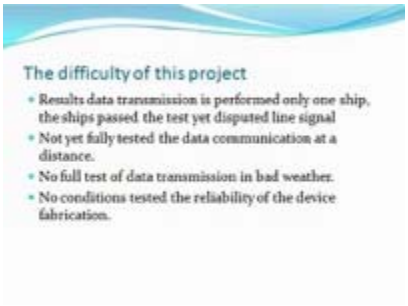

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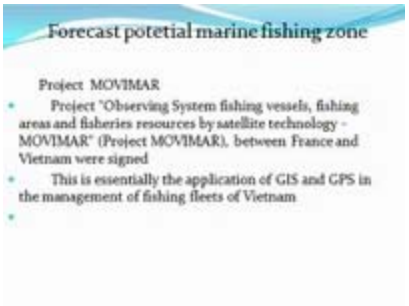

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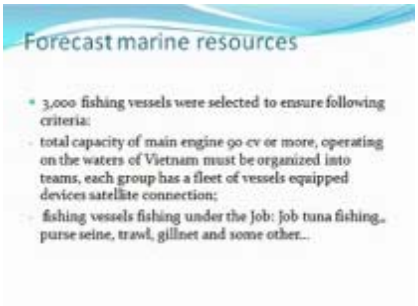

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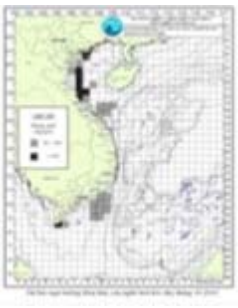

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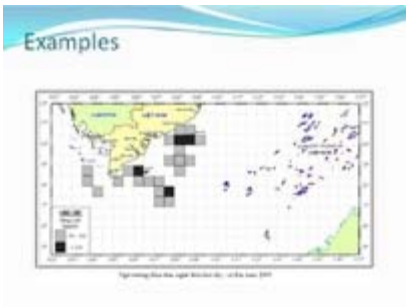

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Lessons learnedfrom Resource mapping,

SEAFDEC project

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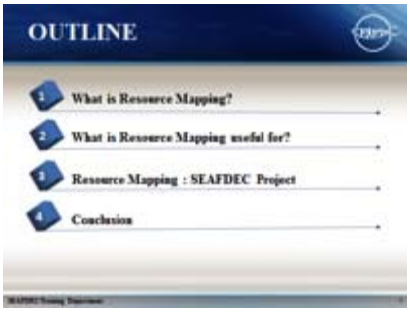

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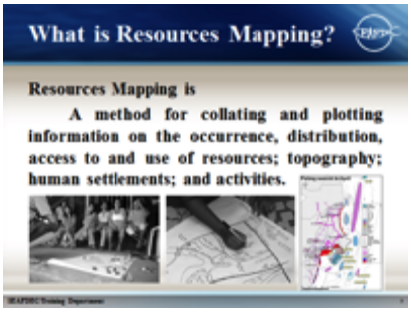

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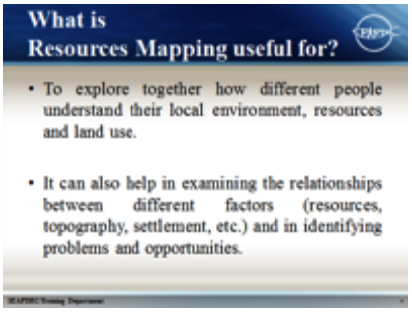

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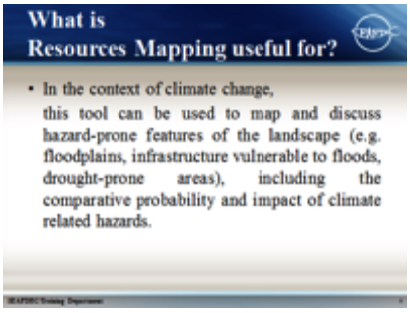

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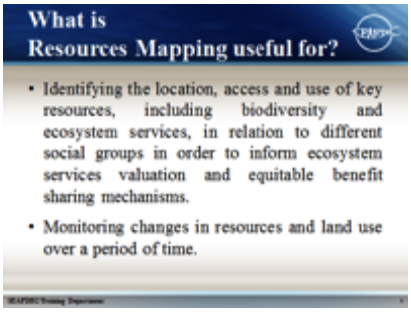

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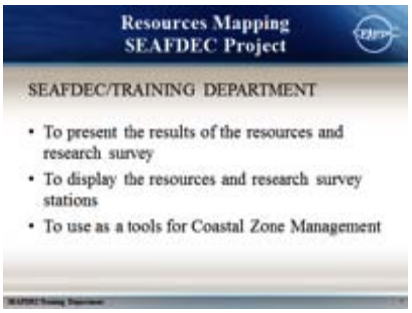

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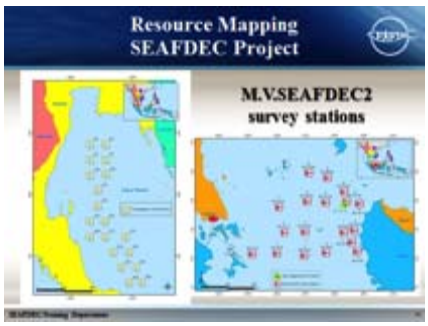

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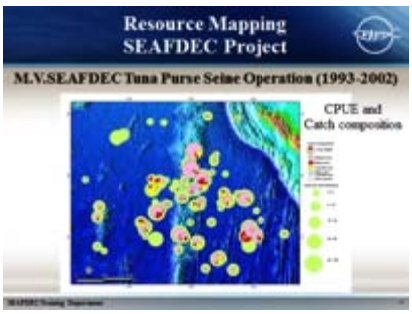

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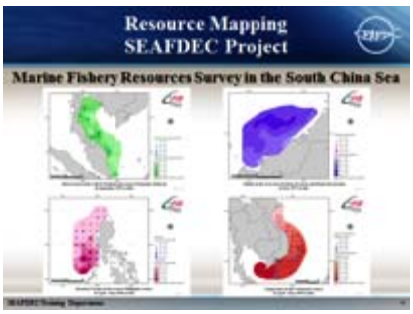

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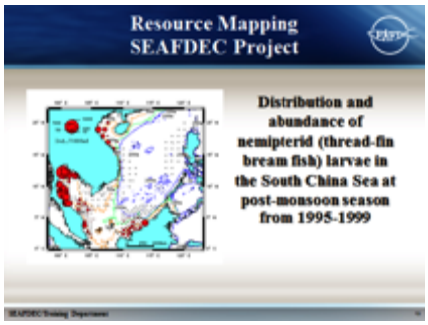

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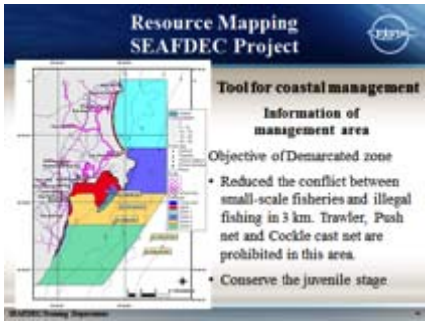

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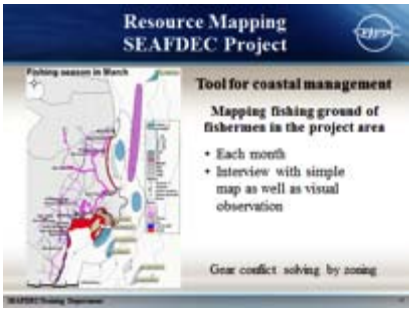

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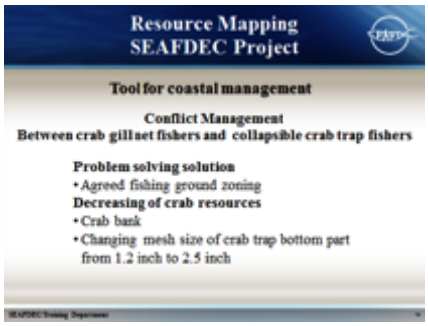

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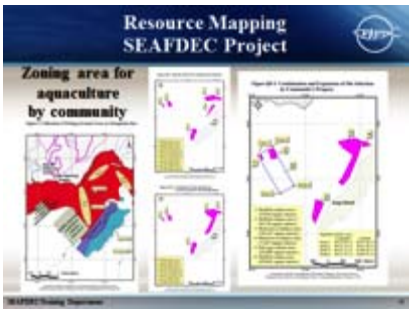

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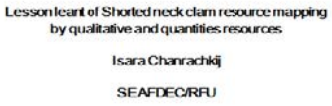
Short neck clam resource mapping by qualitative and quantities resources



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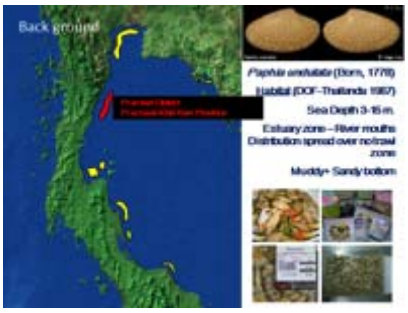

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Identify Fishing spot of dredge fishing
Short Naked Clam (Paphia undulate)

Qualitative data (informal)	Quantitative data (formal)
Analyze "how and why" e.g. structured and semi-structured interviews (includes focus group); surveys using open-ended questions; participatory methods; observation;	**Numerically measure "who, what, when, where, how much, how many, how often"** e.g. standardized interviews, biophysical surveys; surveys using closed questions

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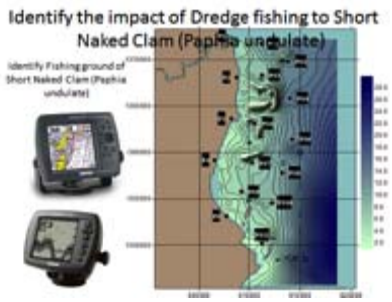

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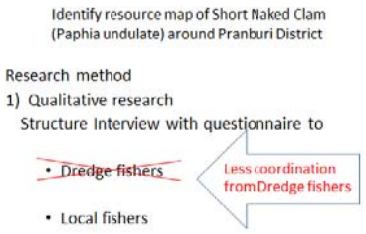

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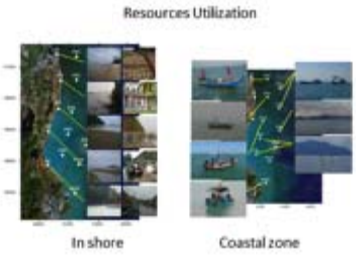

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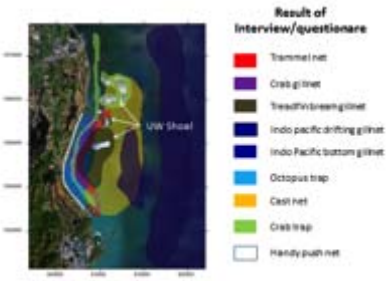

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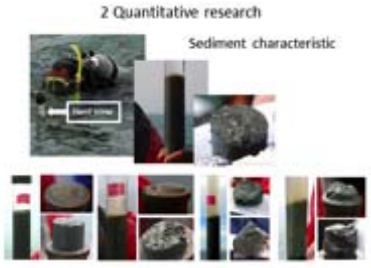

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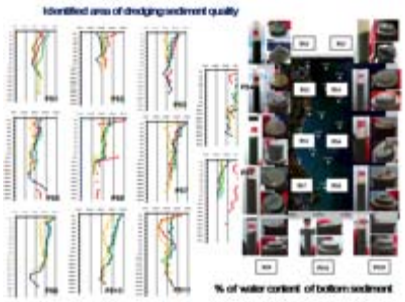

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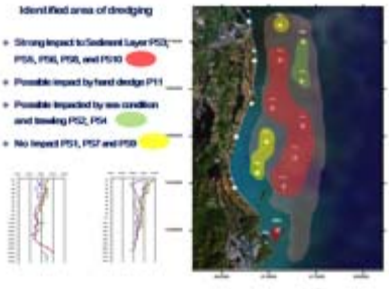

(14)

conclusion

Resource Mapping Possible to used

- Survey
- Local knowledge
- Qualitative research – PRA, RRA
- Qualitative Research

Integrated result to ensure resource mapping

(15)

Annex 8. Training Evaluation Form.

PART 1. What did you actually get from thetraining?

Name _____ Date: _____
Designation/Position: _____ Country: _____

Question 1:
Now that you have finished the training course, how would you rate the**overall usefulness of the training from your job perspective**?

Score:_____

Please use a scale from 1 to 5 (1= not useful at all, 2= useful to little extent, 3= useful to some extent, 4= useful to large extent, 5= extremely useful).

Question 2:
Please score the following training course topics, as delivered, in terms of their usefulness to you from a job perspective: (use the same scale as in Q. 5 above)

Topic	**Score** (1, 2, 3, 4, 5)
Location by satellite system	
Coordinate system	
Practice on - GPS Recording - Point - Line - Polygon	
Practice on Coordinate conversion using spreadsheet	
Practice on Quantum GIS installation and Working with QGIS	
Lecture on Geographic Information System and Data models	
Practice on Editing / update data in QGIS	
Practice on Create data in QGIS	
Practice on Geo-referencing raster data	
Lecture on Data analysis in GIS	
Practice on Working with attributes table, queries, field calculation	
Practice on Working with data analysis function.	
Practice on Map making	

Question 3:
Are there any particular elements/topics that you were missing in this training course and which you would recommend including in future training courses?

Topic 1: _____

Topic 2: _____

Question 4:
Based on the **actualexperience/learning** you have acquired from the training, please select, in prioritized order,**three topics you consider to be the most useful to you from a job perspective** and explain briefly why you find them useful (use the suggested list of topics from Q6 as guidance and add topics as needed).

Topic 1 _____
Why useful?:_____
_____
_____
Topic 2 _____
Why useful?:_____
_____
_____
Topic 3 _____
Why useful?:_____
_____
_____

PART 2. Course design & delivery Date: _____

Course design						
Course too short <	1	2	3	4	5	> Course too long
Pace too slow <	1	2	3	4	5	> Pace too fast
Too few topics <	1	2	3	4	5	> Too many topics

Please comment:

Course trainers Please rate each trainer according to each category: 1 = poor 2 = fair 3 = good 4 = excellent			
Name of trainer: …… *……*			
Knowledge……	1 2 3 4	1 2 3 4	1 2 3 4
Style & approach……	1 2 3 4	1 2 3 4	1 2 3 4
Preparation & organization……	1 2 3 4	1 2 3 4	1 2 3 4

Friendliness &responsiveness.	1	2	3	4		1	2	3	4		1	2	3	4

Please comment:

Training methods

	Poor	Fair	Good	Excellent
Presentations ……..	1	2	3	4
Practical activities ……..	1	2	3	4
Group discussions and participation……	1	2	3	4
Other media/videos……..	1	2	3	4
Quality of materials …….	1	2	3	4

Please comment:

Administration

How do you rate the service from the course administration staff?

Poor < 1 2 3 4 > Excellent

Please suggest improvements: