

Fisheries Resources Enhancement

Component Title: Promotion of sustainable aquaculture and resource enhancement in Southeast Asia

Sub-Component Title: Preservation of critical fishing ground

Program Title: Promotion of sustainable fisheries resources enhancement measures in critical habitats/fishing grounds in Southeast Asia

Responsible Department: Training Department

Countries involved: SEAFDEC Member Countries

Leading Countries: Thailand

Total Project Duration: Year **2010-2014** (5 years)

Project Fund: Japanese Trust Fund (**JTF-5**)



OBJECTIVES

1

Investigate/diagnose the status fishery resource in critical fishing grounds and fishery refugia sites;

2

Evaluate feasibilities and environmental/socio-economical impacts of resource enhancement practices; and

3

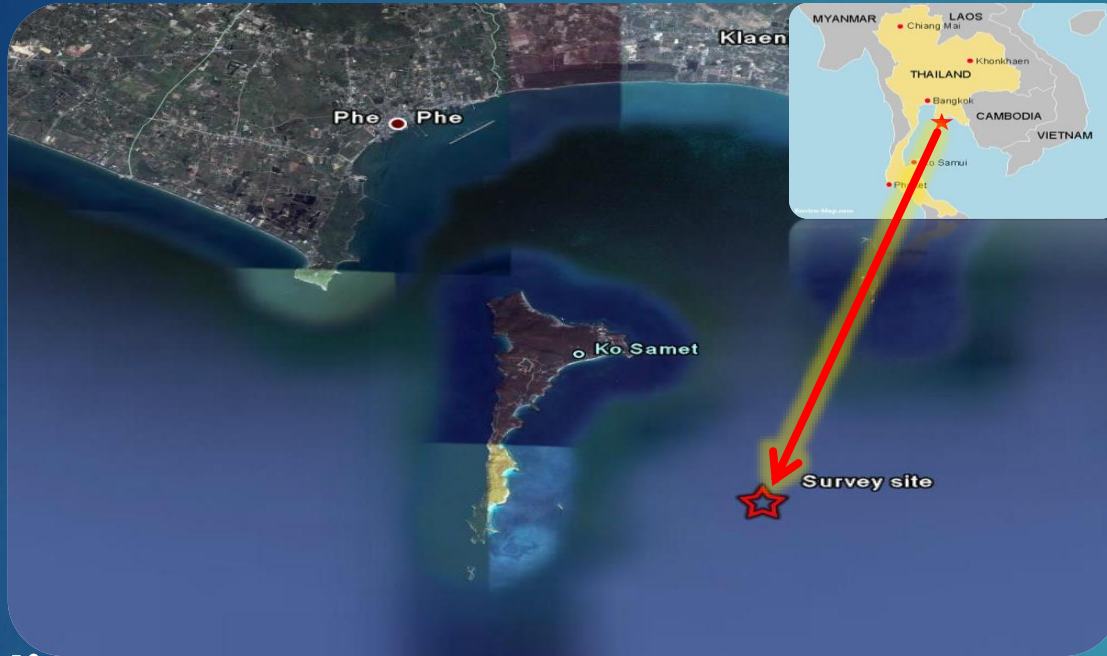
Develop regional management approach of coastal fisheries in rehabilitated habitats in ASEAN Region

Review and update information on the previous activities on rehabilitation of fisheries resources and habitat/fishing grounds for resources enhancement conducted by TD

- 1) Environmental Survey Studies on Artificial Reefs in Rayong Province, Thailand: Technical assistance in a pilot site for suitable designs of resource enhancement practices (Act. 2.1)**
- 2) Resources Conservation and Enhancement in Nam Houm Reservoir, Lao PDR**
- 3) Habitat Conservation and Resources Enhancement in Seagrass beds in Sriboya Island, Krabi Province, Thailand**

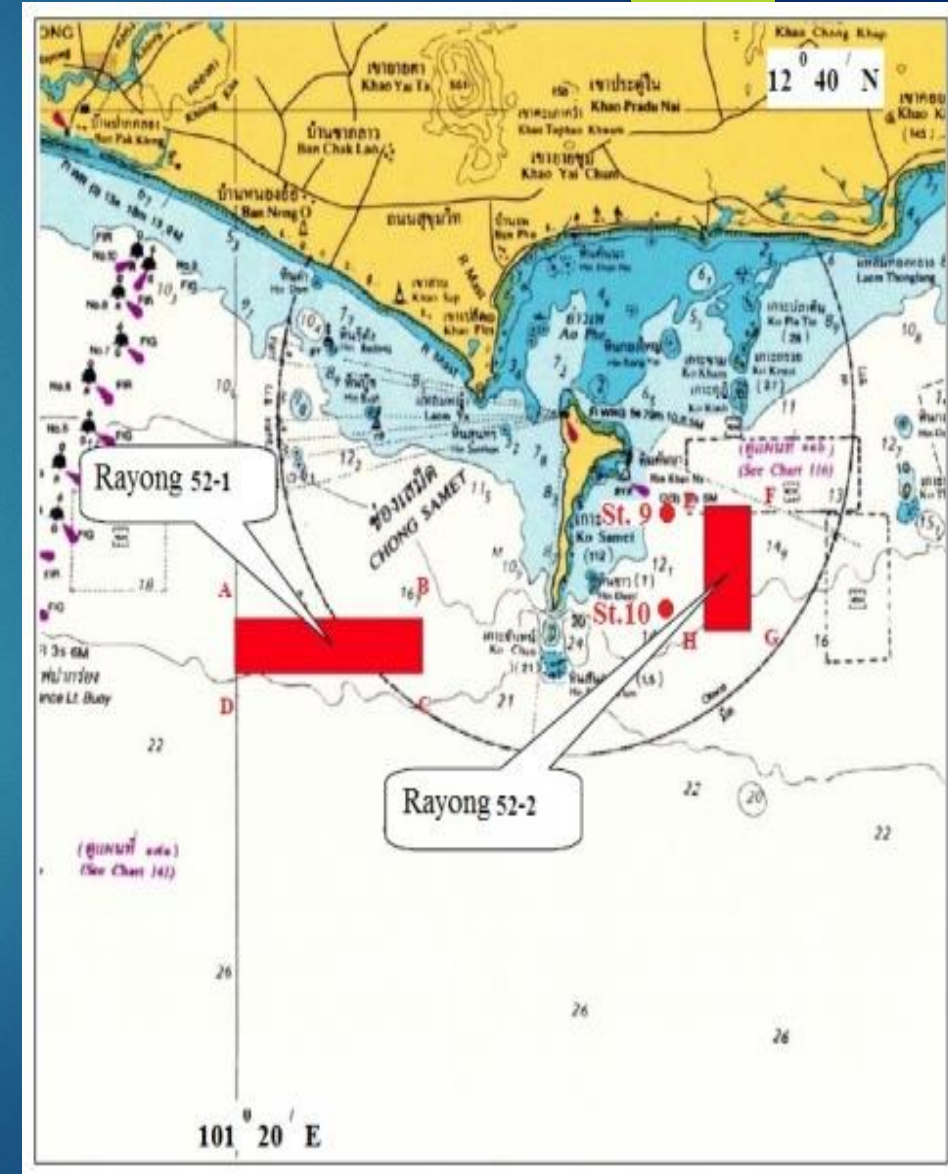
Environmental Survey Studies on Artificial Reefs in Rayong Province, Thailand: Technical assistance in a pilot site for suitable designs of resource enhancement practices (Act. 2.1 Technical assistance in a pilot site for suitable designs of resource enhancement practices)

1



Objective:

This project is anticipated to seek suitable designs of resources enhancement practices for SEAFDEC's member countries and to disseminate the findings for proper management of coastal resources in the future.



Survey methods

- Resources surveys by means of fishing operations and benthos sampling surveys mainly at the G-18 Position

1. Fish trap operation (St. 5, St. 6, St. 9, St.10)

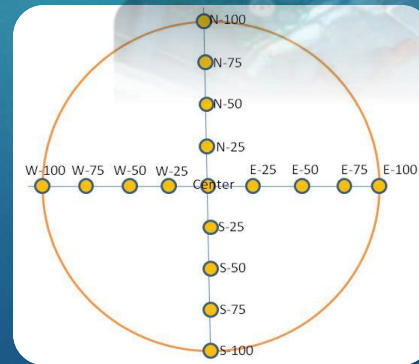
2. Bottom gill net operation (Trammel-net)

3. Juvenile fish traps operation

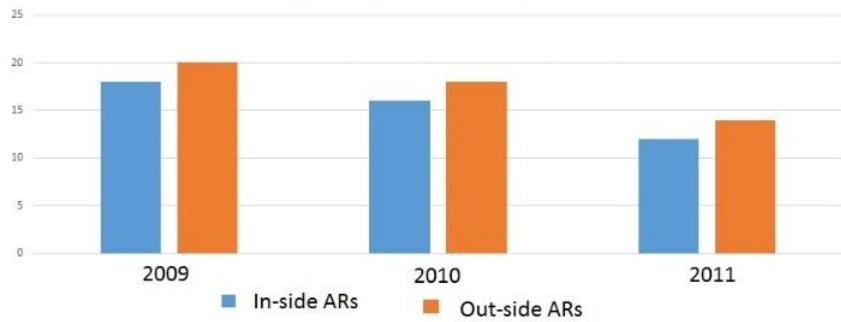
4. Hand-lines operation

5. Macro benthos survey

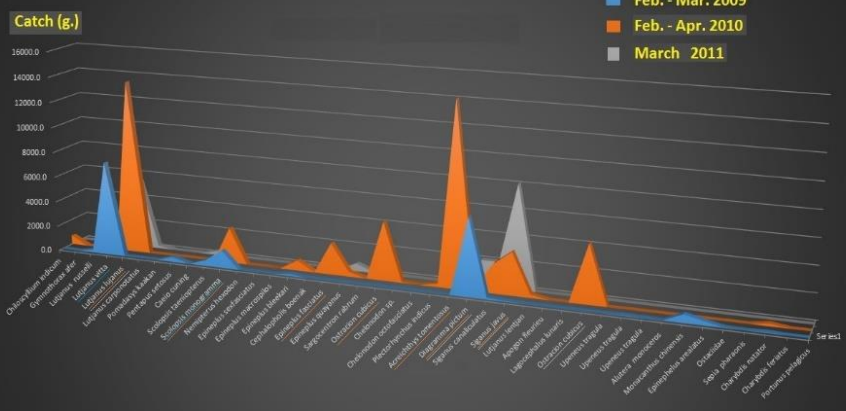
6. Underwater observation



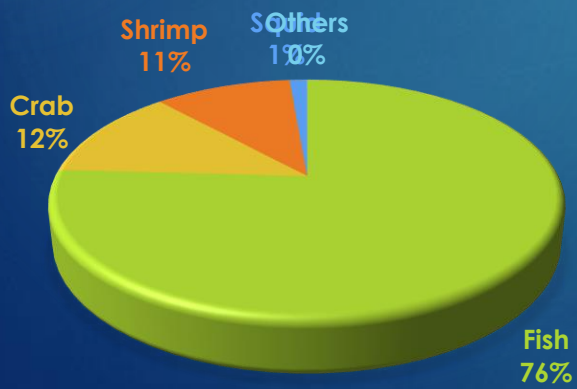
Number of species catch by fish trap In-side and Out-side ARs, Rayong-2






Catch by Fish Trap in ARs Rayong-2

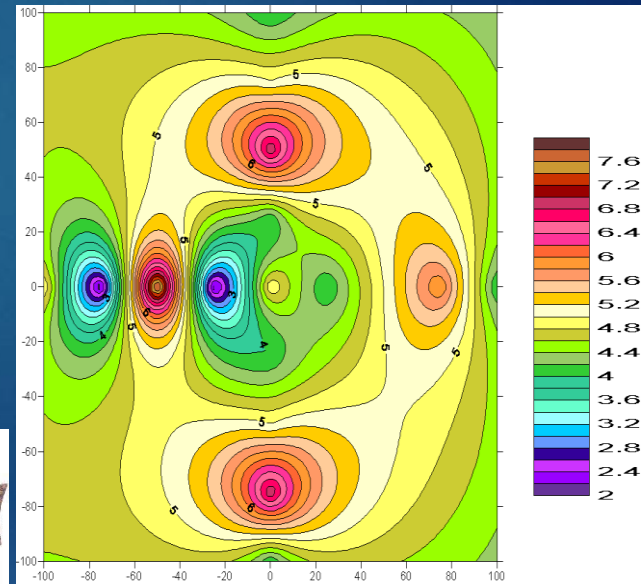
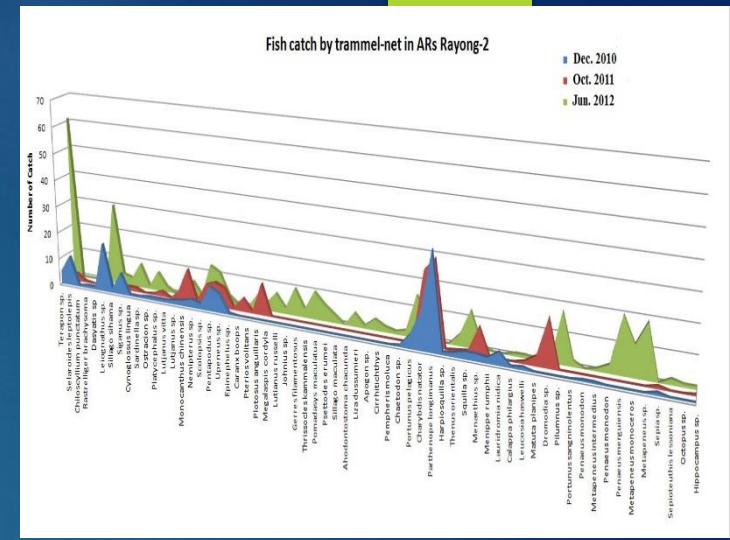


CATCH COMPOSITION BY TRAMMEL NET 2012



Scientific name	Larval stage	Adult stage
<i>Upeneus</i> sp.		
<i>Upeneus</i> sp.		?
<i>Alepes</i> sp. (<i>kleinii</i> or <i>melanopectera</i>)		
<i>Gnathanodon</i> sp.		
<i>Encrasicholina heteroloba</i>		
<i>Encrasicholina</i> sp.		?
<i>Archamia</i> sp.		
<i>Secutor ruconius</i>		
Loliginid squid		
Nereididae		?

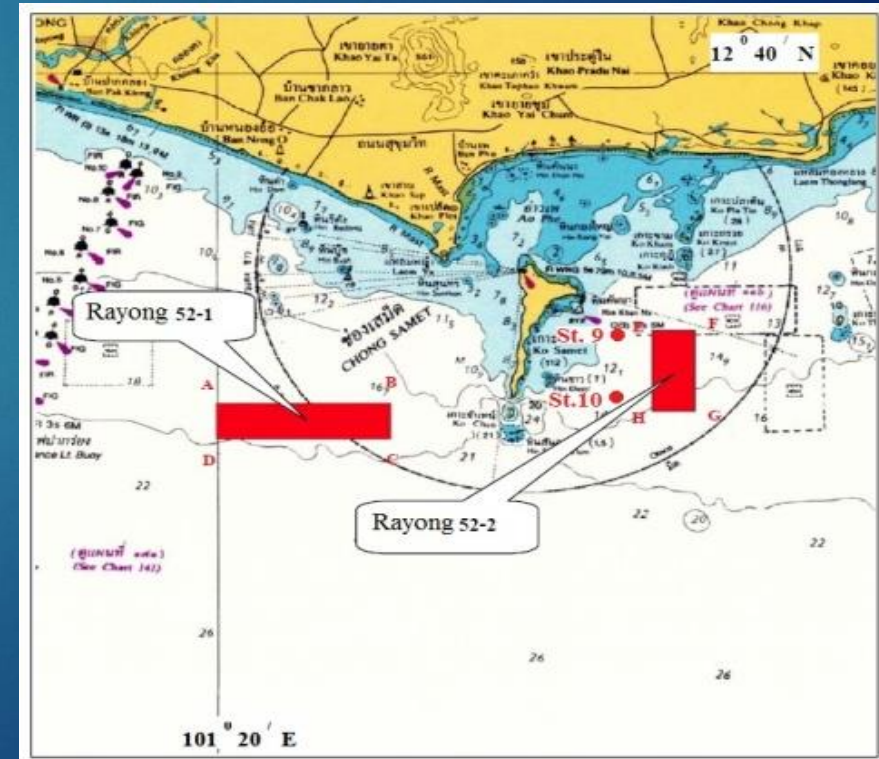
Remark: Scale bar indicates 1 cm long



Questionnaire interview to fisherman around Rayong beach



- The major fishing gear using are fish trap, squid trap, bottom gill-net, hand-line, and towing-line.
- Most of fishermen operated fishing gear around ARs Rayong-2 as occasionally, because of abundance of fish around ARs are not enriched
- Fishermen prefer to operated fishing around ARs Rayong-1, even though, it farer from home port and rough sea condition than ARs Rayong-1



Conclusion

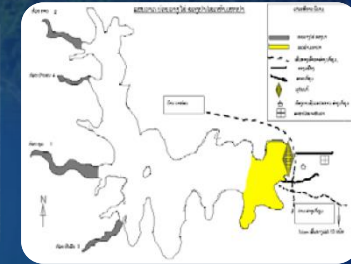
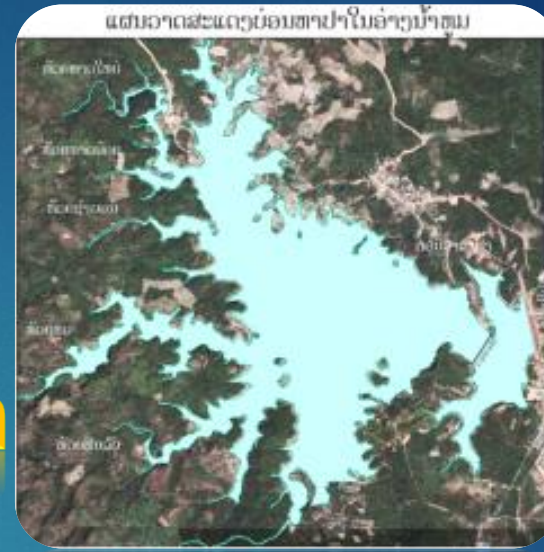
- ✓ Environmental survey studies on ARs Rayong-2, has been conducted in Rayong Province, Thailand during 2009-2014 by SEAFDEC-Training Department and EMDEC (Eastern Marine Fisheries Research and Development Center), DOF under JTF-5 program.
- ✓ Fisheries resources around ARs Rayong-2 seems to be less enhancement due to limited of geographical condition of ARs,
- ✓ Most of fishermen operated fishing gear around ARs Rayong-2 as occasionally, because of abundance of fish around ARs are not enriched,
- ✓ Fisheries resources around ARs Rayong-2 strongly effected by crude oil leaking accident, it need for some period to be self recover,
- ✓ Future planning for ARs installation site should be consideration based on purpose of ARs installation, physical oceanographic information, target fisheries resources, and utilization of stakeholders,
- ✓ Further study on the fisheries resources enhancement by ARs should be continue for future planning for ARs design and installation.



2 Resources Conservation And Enhancement In Nam Houm Reservoir, Lao PDR

Project implementation plan

1. Observe and update information collection (2010-2011)
2. Resources enhancement activities (2012-2014)
 - 2.1 mobile hatchery
 - 2.2 fish shelter



ACHIEVEMENTS OF ACTIVITIES

Activity 2

Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds

Sub-Activity 2.2

Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management

- ✓ Technical assistance in a pilot site for suitable designs of resource enhancement practices was also extended to **Lao PDR** for inland fisheries resource rehabilitation. “**Nam Houm Reservoir**” was selected for case study on the identification and evaluation of fisheries ecosystem in the fresh water system

- ✓ Promotion of **common silver-barb** (*Barbonymus gonionotus*) seed releasing through on-site training on mobile hatchery was successfully conducted to sustain the livelihoods of fishing communities around the reservoir (around 40 fisher folks). They also learned how to breed and nurse the fingerlings prior to releasing

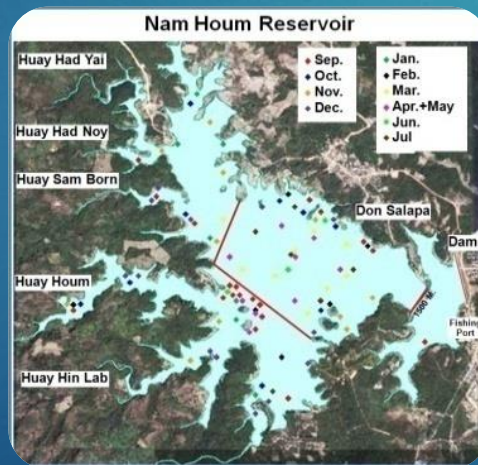


ACHIEVEMENTS OF ACTIVITIES

Sub-Activity 2.2

Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management

- ✓ Permanent conservation area has been demarcated and declared in Nam Houm Reservoir for nursery ground protection
- ✓ A follow-up phase on the nursery techniques was conducted to enhance the skills of fisher folks that would contribute to future tasks



ACHIEVEMENTS OF ACTIVITIES

Sub-Activity 2.2

Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management

- ✓ 50 units of **fish apartments** (developed by SEAFDEC) were constructed and deployed in the conservation area for protection of brood-stock and fish sanctuary in Nam Houm Reservoir through hands-on training in fishing communities, approx. 40 fisher folks participated in this training

- ✓ Importance of conservation area was widely recognized by fisher folks around the reservoir

- ✓ Investigations of fish species compositions by gill net operations, fish landing survey and discussion with local fishermen and fisheries officers provided primary information and status of reservoir production including fishing gear and fishing ground



Constraints of Activities Implementation and Solution

Illegal fishing operation:

- ❖ Enhance skills of fishers in operation and management of mobile hatchery and enhancement; and
- ❖ Promote the adoption of fish shelter for the conservation zones

Lesson Learned

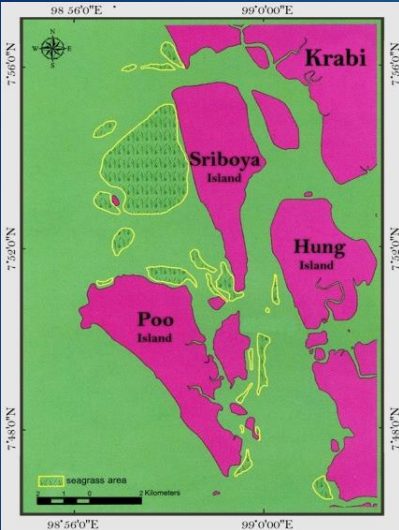
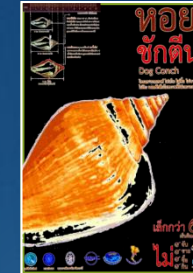
- Technical knowledge and techniques from experts on resources conservation and enhancement had transferred to local officers and fishers
- Local officers and fishers improve awareness on the importance of conservation and management of inland ecosystems for the sustainability of inland fisheries

3

Habitat Conservation and Resources Enhancement in Seagrass beds in Sriboya Island, Krabi Province, Thailand

Objectives of Implementation

- 1) To understand, identify and evaluate the importance of fisheries ecosystems as sources of recruitment, sustainability in coastal communities
- 2) To enhance the ecosystems through human intervention in order to improve the livelihoods of coastal communities
- 3) To develop strategies and actions in rehabilitating the critical fishing grounds as practical management measures
- 4) To properly manage fisheries resources in the seagrass beds



ACHIEVEMENTS OF ACTIVITIES 2010-2014

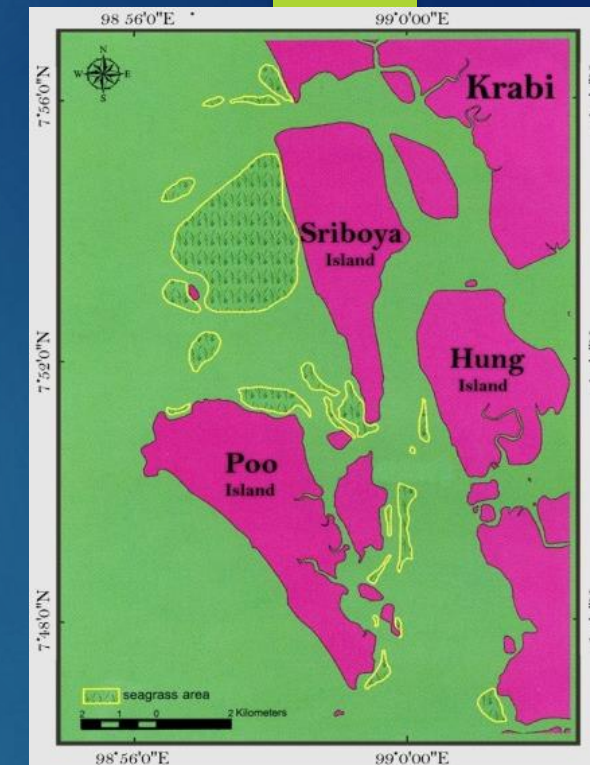
Activity 2

Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds

Sub-Activity 2.2 Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management

✓ A selected pilot site for the purpose of diagnosing fishing grounds and monitoring the achievements of rehabilitation program in sea grass beds in Krabi Province (Andaman Sea), Thailand was followed up during 2-7 April and 27-31 August 2012

✓ Investigation on the fish species compositions by using juvenile fish traps, trammel net, collapsible crab trap and handheld push net operations.



ACHIEVEMENTS OF ACTIVITIES 2010-2014

Activity 2

Technical assistance in pilot project sites and capacity building on rehabilitation of fisheries resources and habitats/fishing grounds

Sub-Activity 2.2

Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management

- ✓ Seed releasing of dog conch was simultaneously made in the selected site.
- ✓ Successfully done on the demarcation for conservation area (as agreed by local fisher community) of the dog conch. Installation of marked buoys in the conservation area of 200×200 m² were completed. New stock of dog conch of 30,000 seeds were released in demarcated area by local fishers and officers concerned.



“ Dog conch conservation and rehabilitation in the seagrass beds, Sriboya Island, Krabi Province, THAILAND ”

- ✓ A local seminar (2nd) on Dog conch resource management organized and attended by 70 participants from representing-stakeholders from the Andaman sea-side, DOF-Thailand and SEAFDEC-TD on the 20th August 2014 in Krabi Province, Thailand



- ✓ Agreed to ban the harvest of under-sized dog conch (< 6 cm.)

เล็กกว่า 6 เซนติเมตร

หอยชักตีน Dog Conch

โครงการอนุรักษ์ ไม่เก็บ ไม่ซื้อ ไม่ขาย ไม่กิน หอยชักตีนในขนาดที่ไม่เหมาะสม

ไม่

- ✓ จับ
- ✓ ขาย
- ✓ ซื้อ
- ✓ กิน

Logos: มูลนิธิเอ็นไลฟ์, กรมประมง, สภาการศึกษาจังหวัดกระบี่, SEAFDEC, UFP, and others.

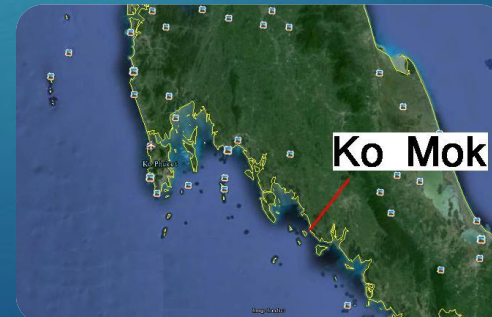
ACHIEVEMENTS OF ACTIVITIES IN 2014 (2)

(cont'd)

Sub-Activity 2.2

Technical assistance in pilot sites for diagnoses of fishing grounds and evaluation of fishery ecosystem management

- ✓ Only hand collection of dog conch is allowed/no air-supplied equipments for diving. Using dredges or net with or without motorized boat is also prohibited
- ✓ Permanent dog conch conservation areas were established by local fishing community in Sriboya Island, Krabi province, and Muk Island, Trang province, while the issue is under consideration for Sarai Island, Satul province
- ✓ Declaration of conservation area for dog conch considered for establishment in each area by the fishing communities
- ✓ Dog conch conservation campaign posters, brochures, stickers and banners were distributed for public awareness (e.g. markets, tourist attractions and fishing villages)



เขตพื้นที่อนุรักษ์พ่อแม่พันธุ์หอยชักตีน เกาะศรีบอยา จ.กระบี่

Conservation sign



เขตพื้นที่อนุรักษ์พ่อแม่พันธุ์หอยชักตีน
ในแหล่งหญ้าทะเล หมู่ 7 บ้านหลังเกาะ



เกาะศรีบอยา
อำเภอเหนือคลอง
จังหวัดกระบี่
ครอบคลุมพื้นที่

200 x 200 ตารางเมตร

ตามแผนการบริหารจัดการหอยชักตีน
ทางฝั่งทะเลอันดามันเพื่อการฟื้นฟู
และขยายพันธุ์ทรัพยากรหอยชักตีน
ให้ใช้ประโยชน์อย่างยั่งยืน





พิกัดพื้นที่อนุรักษ์

1. 7° 53.629' เหนือ, 98° 58.206' ตะวันออก
2. 7° 53.629' เหนือ, 98° 58.316' ตะวันออก
3. 7° 53.521' เหนือ, 98° 58.206' ตะวันออก
4. 7° 53.521' เหนือ, 98° 58.316' ตะวันออก

มาตราส่วน 1 : 4,000

0 100 200 400
Meters

-  แหล่งหญ้าทะเล
-  พื้นที่อนุรักษ์พ่อแม่พันธุ์หอยชักตีน





เขตห้ามล่าสัตว์ป่าหมู่เกาะอ่างทอง อ.เกาะพะงัน จ.สุราษฎร์ธานี

แผนที่แสดงพื้นที่ห้ามล่าสัตว์ป่าหมู่เกาะอ่างทอง

พื้นที่ห้ามล่าสัตว์ป่าหมู่เกาะอ่างทอง มีพื้นที่ประมาณ 75 ตารางกิโลเมตร ประกอบด้วยเกาะต่าง ๆ 42 เกาะ มีพื้นที่ป่าชายหาด 1,200 ไร่ ป่าชายหาดเป็นแหล่งที่อยู่อาศัยของสัตว์ป่าหายากและใกล้สูญพันธุ์ เช่น เต่ามะเฟือง นกนางแอ่นทะเล และนกนางนวลทะเล นอกจากนี้ยังมีหาดทรายขาวสะอาด น้ำทะเลใสสะอาด และทัศนียภาพที่สวยงาม

ชนิดพันธุ์สัตว์ป่าที่พบ

- เต่ามะเฟือง (Chelonia mydas)
- เต่าหญ้า (Caretta caretta)
- เต่าตนุ (Dermochelys coriacea)
- เต่ากระ (Eretmochelys imbricata)
- นกนางแอ่นทะเล (Anous stolidus)
- นกนางนวลทะเล (Puffinus pacificus)
- นกเงือก (Halcyon senegalensis)
- นกขมิ้น (Ceryle alcyon)
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- นกขมิ้นน้ำเค็ม (Ceryle alcyon)



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เขตห้ามล่าสัตว์ป่าหมู่เกาะอ่างทอง อ.เกาะพะงัน จ.สุราษฎร์ธานี

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08.10.2014

Lessons learned, outputs and successful of activities

- ✓ A pilot site seagrass beds in Sriboya Island to showcase the achievements and lessons learned in the management of seagrass beds as well as protect breeding/spawning areas through establishing dog conch and seagrass beds conservation area
- ✓ Successful coastal zone management requires the participation of multi-stakeholders; local communities, government authorities, NGOs, scientist or researchers and investors
- ✓ All the parties should have the chance to express and exchange their opinions, when all needs and problems have been discussed scientists or researchers could then provide their expertise in formulating the management plan
- ✓ Similar activities could apply and expansion to another provinces in Andaman sea

Conclusions and Recommendations

Seagrass beds areas and dog conch should be conserved and managed by applying as following:

- ✓ Promoting collaborative working between government sector and local people who directly utilized the seagrass habitat and dog conch resources
- ✓ Increase awareness on protection and conservation seagrass areas for all sectors
- ✓ Conducting research and enhance knowledge about seagrass restoration as well as provide knowledge to people
- ✓ Prohibit the use of some fishing gears that destroy seagrass beds such as trawl nets, seine nets, dredge and promote use of small fishing gears for fishery in seagrass beds, including massive harvested by diving with air pump supply
- ✓ Enhance knowledge regarding benefits and importance of seagrass ecosystem and dog conch resources through mass medias in many aspects i.e. nursery ground, shelter and feeding habitat of marine fauna
- ✓ Hold the seminar on seagrass and dog conch conservation for fishers and local communities who do fishing within seagrass beds
- ✓ Organizing the local people to perform in-group in order to protect and conserve their fishing ground for their living
- ✓ Establish the national master plan for seagrass management to be used a conservation framework for governmental agencies and communities



CONSOLIDATING THE STRATEGIES FOR FISHERY RESOURCES ENHANCEMENT IN SOUTHEAST ASIA



Proceedings of the Symposium on Strategy for Fisheries Resources Enhancement in the Southeast Asian Region
Pattaya, Thailand 27-30 July 2015



- ❖ Fishery Resources Enhancement through Habitat Improvement and Management
 - ❑ Artificial Ponds in Fisheries Management
 - ❑ Establishment and Management of Fisheries Refuges
- ❖ Habitat Rehabilitation in Fisheries Management
 - ❑ Coral Reef, Seagrass Beds, Mangrove Forests, Island Habitats
- ❖ Fishery Resources Enhancement through Artificial Propagation and Stock Release
 - ❑ Stock Enhancement and Restocking: Potential and Limitations
 - ❑ Coral Reef, Seagrass Beds, Mangrove Forests, Island Habitats
 - ❑ Stock Enhancement and Restocking: Potential and Limitations
 - ❑ Review Strategies and Ecological Interaction with Natural Stock
- ❖ Aquaculture-based Enhancement and Restocking



Training Department
Southeast Asian Fisheries Development Center
Samutprakan, Thailand December 2015

Publication distribution of Consolidating the strategies for fisheries resources enhancement in Southeast Asia “Proceedings of the Symposium on Strategy for Fisheries Resources Enhancement in the Southeast Asian Region”.

<http://www.seafdec.or.th/home/index.php/component/jdownloads/send/8-td-publications/569-consolidating-the-strategies-for-fishery-resources-enhancement-in-southeast-asia?Itemid=0>



FISH for the PEOPLE
A Special Publication for the Promotion of Sustainable Fisheries for Food Security in the ASEAN Region
Volume 14 Number 2: 2016 (Special Issue) Bangkok, Thailand, ISSN: 1685-6546

SEAFDEC at 49:
Sustaining Regional Support to Combat IUU Fishing and Enhance Competitiveness of ASEAN Fish and Fishery Products

Information dissemination on “Strengthening fisheries resources rehabilitation measures to mitigate the impacts of IUU fishing” through SEAFDEC Fish for the People (Vol. 14 No. 2)

THANK YOU

