



BEST PRACTICE FISHING GEARS AND METHODS

Project Coordinating Unit (PCU) in collaboration with SEAFDEC/TD



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Fisheries of the South China Sea

Fish stocks critically important for food security, income, and foreign exchange



Fish production from SCS \approx 10% of global production



Most fish stocks fully-fished or over-fished



Future landings will decline unless total effort reduced



Difficult to reduce effort – high community dependence



- **Loss of Fisheries Habitats of the South China Sea (Vo et al, 2013)**

Continued decline in the total area of habitats has raised serious concerns for sustainability of fisheries

Estimated Decadal Rates of Habitat Loss:

- ❖ Seagrass – 30%
- ❖ Mangroves – 16%
- ❖ Coral Reefs – 16%

- ❖ **Fishing is a key factor in the continued loss of marine habitats and biodiversity in the South China Sea**





destructive and/or unsustainable fishing gear and practices in The South China Sea

- *Push netting and inshore trawl fishing*
- *Digging and gleaning*
- *Blast fishing, poisons*
- *unselective fishing gears/practices*





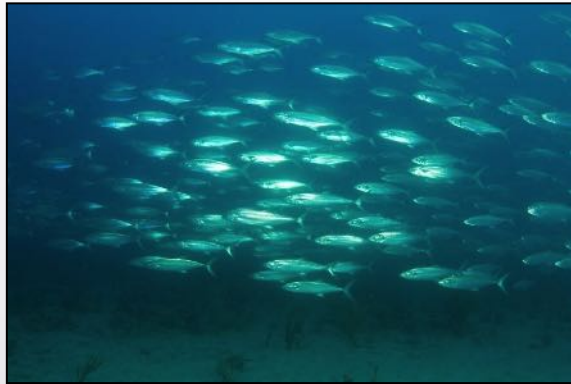
Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand

The specific objective of this project is:

'To operate and expand the network of fisheries refugia in the South China Sea and Gulf of Thailand for the improved management of fisheries and critical marine habitats linkages in order to achieve the medium and longer-term goals of the fisheries component of the Strategic Action Programme for the South China Sea'.



Component 2: Improving the management of critical habitats for fish stocks of transboundary significance via national and regional actions to strengthen the enabling environment and knowledge-base for fisheries refugia management in the South China Sea



Component Indicator(s): (a) Status of enabling environment reform, including extent of behavioural change among small-scale fisherfolk at priority sites; (b) Extent of use of available environmental state and socio-cultural information in policy and planning frameworks



Results framework for project component 2

Component	Outcomes	Indicator	Baseline	Targets End of Project	Source of Verification	Risks and Assumptions
2. Improving the management of critical habitats for fish stocks of transboundary significance via national and regional actions to strengthen the enabling environment and knowledge-base for fisheries management in the South China Sea and Gulf of Thailand	2. Increased institutional capacity in the 6 participating countries for the designation and operational management of fisheries refugia via the transformation of enabling environments and the generation of knowledge for planning	<i>Status of enabling environment reform, including extent of behavioural change among small-scale fisherfolk at priority sites Extent of use of available environmental state and socio-cultural information in policy and planning frameworks</i>	<i>Weak enabling environments and limited knowledge within national fisheries and environment departments and ministries with respect to the implementation of measures aimed at managing threats to fish stock and critical habitat linkages</i>	<i>National and regional policy, legal and planning frameworks for demarcating boundaries and managing fisheries refugia, resulting in, inter alia, a 20 percent increase in small-scale fishing vessels using fishing gear and practices designed to safeguard fish stock and critical habitat linkages at priority sites</i>	<i>Endorsed policies and plans Regular reports of meetings of national and regional project management bodies Reports of independent mid-term and terminal project evaluations</i>	<i>Willingness of fisheries and environment sectors to agree on guidelines promoting cross-sectorial cooperation and make joint commitments to the reform of national policy, legal and regulatory frameworks governing the management of fisheries refugia</i>



Outcome 2.10 Regionally and locally appropriate best practices generated to address the effects of trawl and motorised push net fishing on seagrass habitat, and the capture of juveniles, pre-recruits and fish in spawning condition

- Demonstrations of best practice fishing methods and practices to address key threats to fish stock and critical habitat linkages demonstrated at priority fisheries *refugia*
 - Identify and trial approaches to reduce the effects of trawl and push net fishing on seagrass habitat
 - Test the use of fishing gear and practices that reduce the capture of juveniles, pre-recruits and fish in spawning condition.



Results from the Stakeholder Consultation Workshop

- Stakeholder Consultation Workshop
 - Cambodia 3 sites; Kep, Kampot and Koh Kong
 - Philippine 3 sites; Bolinao, Mazinloc and Coron
 - Thailand 2 sites; Trat and Surat Thani
 - Malaysia 2 sites; Kuala Baram and Tanjung Lemau
- Identified a priority Species
- Threat to fish life-cycle



Implementation and Selection of Fisheries Refugia Sites

Indo-Pacific Mackerel

Cambodia: Koh Kong
Thailand: Trat



Juvenile Grouper

Cambodia: Kampot



Blue Swimming Crab

Cambodia: Kep
Thailand: Surat Thani



Spiny Lobster

Malaysia: Tanjung Leman



Small Pelagic Fish

Indonesia: Bangka Belitung,
and Tambelan-
Bintan



Rabbit Fish

Philippines: Bolinao



Frigate Tuna

Philippines: Masinloc



Fusilier Fish

Philippines: Coron



Mud Crab

Philippines: Coron



Tiger Prawn

Malaysia: Miri

Penaeid Shrimps

Indonesia: Bengkayang





Cambodia 1

Site Name	Target Species	Stage of life-cycle	Threat	Immediate Cause	Root Cause
Kep	Blue swimming crab	Juvenile	<ul style="list-style-type: none"> • Loss of habitat (i.e. sea grass • Illegal fishing • Habitat destruction • Over fishing 	<ul style="list-style-type: none"> • Use of unsustainable fishing gear/practice (i.e. Small Mesh elongated collapsible trap) • Destructive fishing gear • Purse seine net trawlers 	<ul style="list-style-type: none"> • High market demand • High price • Unsustainable fishing gear using • Destructive fishing gear
	Blue swimming crab	Spawning (December to January)	<ul style="list-style-type: none"> • Destruction of spawning habitat • Loss of seagrass • Over fishing 	<ul style="list-style-type: none"> • Illegal fishing • Trawlers with small mesh size net • Use of inappropriate fishing gear • Small Mesh elongated collapsible trap • Purse seine trawlers • Unsustainable fishing gears 	<ul style="list-style-type: none"> • Effort fishing to catch more fish • High price • High market demand



Cambodia 2

Site Name	Target Species	Stage of life-cycle	Threat	Immediate Cause	Root Cause
Kampot	Grouper (Epinephelus spp.)	Adult	<ul style="list-style-type: none"> Declining fish Habitat destruction 	<ul style="list-style-type: none"> Mouse tailed trap Trawler with ball light 	<ul style="list-style-type: none"> High demand High price in market
	Grouper (Epinephelus spp.)	Fingerlings (October to December)	<ul style="list-style-type: none"> Declining of fingerlings Habitat destruction such as sea grass, coral reef, and mangrove forest 	<ul style="list-style-type: none"> Mosquito(Small) net fishing gear Push net fishing with electric Mouse tailed trap Trawler with ball light Hand Push net 	<ul style="list-style-type: none"> High Demand from cage culture High price in market



Cambodia 3

Site Name	Target Species	Stage of life-cycle	Threat	Immediate Cause	Root Cause
Koh Kong	Mackerel	Spawning (November to January at Koh Kapi, Prek 3& 2, Boeung Kachang, Koh Yor, and Koh Nou)	<ul style="list-style-type: none"> Habitat loss Over fishing 	<ul style="list-style-type: none"> Illegal fishing Mackerel gill net with small mesh size Light Luring fishing Purse seine net and trawlers from neighbouring country Trawlers with small mesh size net from 2.5 to 3cm 	<ul style="list-style-type: none"> High market demand in neighbouring country Destructive fishing gears Illegal fishing from outside area



Thailand 1

Site Name	Target Species	Stage of life-cycle	Threat	Immediate Cause	Root Cause
Trat	Indo-Pacific mackerel	Whole life cycle	<ul style="list-style-type: none"> • Over fishing • Destructive fishing gears (e.g. giant trawls) 	<ul style="list-style-type: none"> • Illegal fishing • Invasion of foreign fishing • Fishing by foreigner workers • High market demand • Needs of small size for processing 	<ul style="list-style-type: none"> • Increasing number of small-scale fishing boats altered from the commercial ones • Non-cooperation of some fishing group • Lacking in fisheries conservation awareness • Insufficiency of public authority • Overlapped functions of relevant public authorities



Thailand2

Site Name	Target Species	Stage of life-cycle	Threat	Immediate Cause	Root Cause
Surat Thani	Blue swimming crab	Whole life cycle	<ul style="list-style-type: none"> • Use of Unsustainable fishing gears • Over fishing 	<ul style="list-style-type: none"> • Illegal fishing • Fishing of small- size crabs in seagrass bed • Small mesh-size nets 	<ul style="list-style-type: none"> • Illegal fishing • High market demand • Lacking in fisheries conservation awareness • Low water quality • Climate change



Philippine 1

Site Name	Target Species	Stage of life-cycle	Threat	Immediate Cause	Root Cause
Bolinao	Rabbit fish (<i>Siganus</i> spp.)	juveniles	<ul style="list-style-type: none"> Over harvesting of juveniles 	<ul style="list-style-type: none"> high demand of fish paste 	<ul style="list-style-type: none"> Easy source of income for marginal fisherman
Mazinloc	Frigate tuna (<i>Auxis</i> spp.)	Pre-recruits / Juvenile	<ul style="list-style-type: none"> Overfishing, use of fine mesh nets 	<ul style="list-style-type: none"> FADs fishing 	<ul style="list-style-type: none"> Due to high demand



Philippine2

Site Name	Target Species	Stage of life-cycle	Threat	Immediate Cause	Root Cause
Colon	Fusilier fish		<ul style="list-style-type: none"> Decreasing of fish Loss of coral habitat 	<ul style="list-style-type: none"> Unsustainable fishing practice: Use of cyanide in the live reef fish industry Blast fishing Non-selective fishing gear and practices Collection of corals as sinker Solid waste pollution 	



Malaysia

Site Name	Target Species	Stage of life-cycle	Threat
Kuala Baram, Sarawak	Tiger Prawn (<i>P. monodon</i>)	Juvenile	• deforestation
		Pre-recruit	• Shrimp push net & bag net
		Adult	• Trawl net
		Spawning	• Trawl net
Tanjung Leman, Johor	Lobster (<i>Panulirus</i> spp.)		



The matrix of the option to manage the fishing that summarized from the FAO technical guidelines for responsible fisheries volume 4 Suppl. 2. The Ecosystem Approach to Fisheries (FAO, 2003)

1. Technical measures	Gear modifications that improve selectivity	<ul style="list-style-type: none"> • Gear restriction • Mesh size restrictions • Fishing method control • Non-target species selectivity (TEDs, JTEDs, C-hook, etc)
	Other gear issues	<ul style="list-style-type: none"> • environmental conditions (light level, temperature, current speed, etc). • Ghost fishing control
	Spatial and temporal controls on fishing	<ul style="list-style-type: none"> • Seasonal closure • Fisheries Refugia • MPA
	Control of the impact from fishing gear on habitats	<ul style="list-style-type: none"> • Prohibition of certain gear in some habitats (trawling in coral reef and seagrass areas) • Replace a high-impact fishing method with one with less impact on the bottom, e.g. trapping, longlining or gillnetting.
	Energy efficiency and pollution	<ul style="list-style-type: none"> • Reduce of CO2 emissions. • Energy optimization



2. Input (effort) and output (catch) control	Controlling overall fishing mortality	<ul style="list-style-type: none">• Capacity limitation spatial/temporal• Access limitations• Effort limitation
	Catch controls	<ul style="list-style-type: none">• By-catch controls (such as quotas)



3. Ecosystem manipulation	Habitat modifications	<ul style="list-style-type: none"> • Preventing habitat degradation • Prohibition of destructive fishing methods in ecologically sensitive habitats (such as seagrass beds); • Prohibition of intentional cleaning of the seafloor to facilitate fishing; and • Reduction of the intensity of fishing in some fishing grounds to ensure that non-target • Providing additional habitat
	Population manipulation	<ul style="list-style-type: none"> • Restocking and stock enhancement
4. Rights-based management approaches		<ul style="list-style-type: none"> • User rights • Effort rights • Catch rights • Effort management



The 2nd Regional Scientific and Technical Committee Meeting for the SEAFDEC/UN Environment/GEF Project on Establishment and Operation of a Regional System of Fisheries Refugia in the South China Sea and Gulf of Thailand, 21st – 23rd May 2019, Thansur Sokha Hotel, Kampot Province (Fisheries Refugia Site), Cambodia

Case study and Experience from SEAFDEC and DoF Thailand



Turtle Excluder Devices (TEDs)

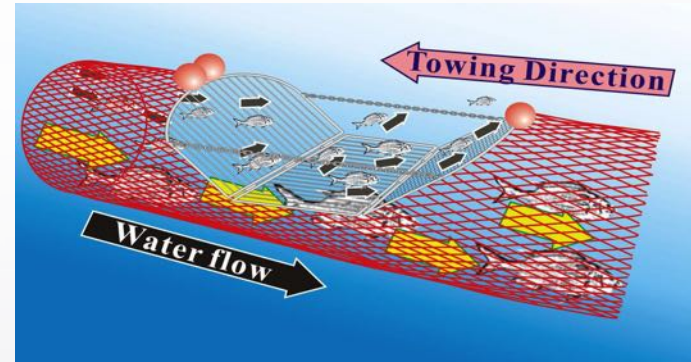
- Incidental catch of marine turtle by trawl fishing
- Demonstration and experiment (Cambodia, Indonesia, Malaysia, Philippine, Thailand, Vietnam, Brunei and Myanmar)
- Training and promotion





Juvenile and Trash Fish Excluder Devices (JTEDs) (1998-2006)

- Catch of juvenile and trash fish problem in Trawl fisheries
- Demonstration and experiment
- Training and Promotion (1998-2006)
- Adoption of JTEDs in Calbayog City, the Philippines
- ASEAN Member countries are continuing on promotion on the use of JTEDs





Crab Bank Project

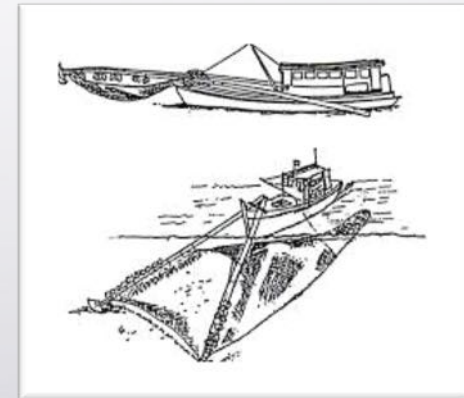
- was started in 2002, Thailand
- solve decreasing of crab resources
- To protect gravid crabs and encourage community awareness in resource conservation
- by depositing gravid blue swimming crab in the cage of crab bank. The crabs are allowed to spawn in the cage
- marking on carapace before releasing to the sea
- CPUE was increasing
- Awareness was increasing





Fishing Gear/Method restriction

- **Thailand** Fisheries Law (2015)
- Gear prohibited
 - Push net
 - Elongated collapsible trap
 - Trawl net with the size of the meshes less than 4 cm.
 - surrounding net with the size of the net meshes smaller than 2.5 centimeters to engage in a fishing operation at night.
- Fishing Gear/Practice restriction and effort control in the coastal zone
 - Trawl
 - Pure seine
 - Luring light fishing
 - Fishing Effort control with many gear(number and length of fishing gear)





The RSTC is invited to provide suggestion, comments and discuss on workplans and selected country for demonstrations of best practice fishing methods and practices





Thank you for your
kind attention