

Name.....

Date.....Place.....



Applying EAFM principles: Case study from the Krabi Province, Thailand

1. Abstract

The case study demonstrates how EAFM has helped to reduce stakeholder conflict and acquire sustainable financing, leading towards sustainable fisheries management in the Krabi Province of Thailand. Bamboo stake nets have been a major problem in the Krabi Province since the early 1970s, resulting in major conflicts and protests among stakeholders. Several attempts to solve the problem by banning stake nets and then trying to apply the law failed several times.

EAFM was introduced in 2017 after a Department of Fisheries (DoF) participated in SEAFDEC's EAFM training. This resulted in increased participation, better coordination and the application of precautionary approach, which resulted in an increase in abundance and diversity of the marine resources, reduced conflicts and improved livelihoods. It also resulted in increased and sustainable funding for future fisheries management.

The main lessons learnt are that Strict law enforcement can be confrontational. It is better to let people adjust their mindsets and attitudes before enforcing the law. Also, fishery officer's need to get to know the fishing communities to identify and acknowledge the problems and encourage people to participate in a process of finding a solution.

Key words: *Increased participation; Coordination; Precautionary approach; sustainable financing*

2. Geography

This case study focuses on Krabi Province, Thailand, which is a world-famous tourist destination. It is known for its karst islands, white sand beaches, mangroves and seagrasses. It is fifth in terms of tourist income each year – six million arrivals each year.

Over 450,000 people live in Krabi, consisting of Buddhists, Muslims and Chao Ley (Monken). Fisheries is one of the most important livelihoods for all these groups. The main marine resources are (i) demersal fish – snapper; (ii) pelagic fish – mackerels, (iii) shellfish - dog conch, and (iv) crustaceans - lobsters/ crab.

3. Timeline

Year	Event
1974	Stationary fishing gear permitted in Krabi and start of bamboo stake net fishery
1980's	Bamboo nets started to be replaced with netting
1990's	Stake net boom
2000	'The Beach' movie that promoted the tourism boom begins
2004	Tsunami wipes out most of the stake net facilities
2009	Number of Stake nets reaches 455. VIP Guest boating accident. Government fund a change in fishing gear. Stakeholder meetings agree to remove all stake nets within 5 years.
2014	New Government takes power- 195 stake nets remain. First demonstrations by stake net fishers and a 1-year extension granted. No new stake nets allowed.
2015	Navy, Department of Fisheries (DoF) prepare to remove remaining stake nets Thai ordinance (No. 58) bans 6 types of fishing gear, including bag nets Controversial plans to renovate and expand Krabi coal plant
2016	Second demonstration by stake nets fishers. Governor arranges public hearing that agrees to remove all remaining stake nets Provincial Fisheries committee established (Governor, DoF, fisher representatives) Similarity between bag nets and stake nets supports their removal and all remaining stake nets removed
2017	66 coastal fisher organizations established Local Fishery management plans (FMPs) drafted Provincial fishery officer attends EAFM training by SEAFDEC, Revision of FMPs – alignment to EAFM principles
2018	Budget for EAFM plan implementation provided. Provincial Governor fund established and a Provincial cluster fund. Electricity Generating Authority of Thailand (EGAT) and Ladkrabang University influence Establishment of crab bank, conservation area, (shellfish), artificial reef, and restocking programme. Livelihood diversification promoted - fish processing group, bee keeping group, eco-tourism group, souvenir group, Thai snacks, agriculture groups SEAFDEC pilot project starts in Nai Nang Village
2019	Additional budget acquired from Prime Minister's office SEAFDEC EAFM training for stakeholders in Krabi and implementation of EAFM plans and encouraging participation in EAFM activities

4. Reason why it is a valuable case study

Applying the EAFM principles of increase participation, coordination and the precautionary approach resulted in an increase in the animal resources and improved livelihoods. The case study demonstrates how EAFM has helped to reduce stakeholder conflict and acquire sustainable financing, leading towards sustainable fisheries management.

5. Reason why EAFM

The problem of bamboo stake nets was an on-going problem for many years and attempts at fishery law enforcement (top down management) did not solve the problem. As seen in

the timeline (above) there were many attempts to solve the problem by banning the gear, but it required a different approach to reach any resolution.

6. Problems/issues

	Ecological	Governance	Human
Problem:	<ul style="list-style-type: none"> illegal fishing: bamboo stake trap 	<ul style="list-style-type: none"> no clear boundary of fishing area conflict with small-scale fisheries and large-scale fisheries and between small-scale fisheries (conflict between bamboo stake trap and mackerel gillnet) 	<ul style="list-style-type: none"> Less income

7. Results

EAFM has contributed to:

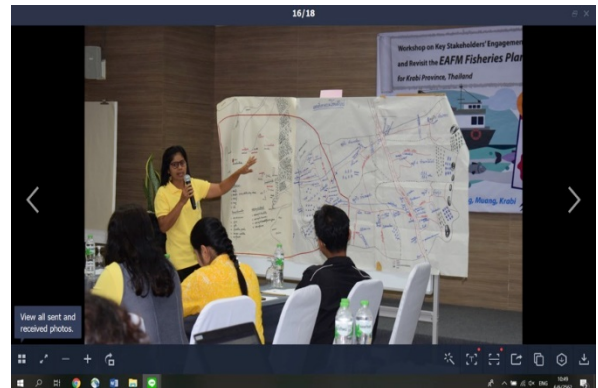
- Increased fisheries resources
- Reduced stakeholder conflict
- Livelihood diversification (but most still fishing)
- Improved relationship between Gov agencies and communities

8. Lessons learnt

- Strict law enforcement can be confrontational.
 - Better to let people adjust their mindsets and attitudes before enforcing the law.
- Officers need to get to know the particular community.
 - to identify and acknowledge the problems and encourage people to participate in a process of finding a solution.

9. Recommendations for solutions/next steps

DoF and SEAFDEC remain engaged in building/ supporting the capacity for EAFM implementation in Krabi.



Applying EAFM principles: Case study from Kampot, Cambodia

1. Abstract

This case study demonstrates a recent introduction to an area where, although communities had the power to manage and protect marine resources, they lacked the skills, coordination and cooperation need to achieve sustainable fisheries management.

The Trapang Ropov fishing ground was formed by two community fisheries (Cfi) located in the trans-boundary between Preah Sihanouk and Kampot provinces in Cambodia. It is the main fishing ground for local communities who are living in Trapang Ropov and Prey Nup 2 fisheries communities. The site has various fisheries resources, fish, blue swimming crab, seagrass bed conservation, blood cockle refugia and mangrove area. It also has habitat for endangered species like dugong, sea turtles, and sea horses.

Through EAFM, the site developed a EAFM management plan in late 2018 under support from SEAFDEC. The plan helped the stakeholders share a vision for the future management of the resources and set up a number of goals and objectives. Each objective had a number of management actions aimed at achieving the objectives along with indicators and benchmarks on which to monitor and evaluate progress.

The plan encouraged:

- Joint transboundary management fisheries resource between two provincial fisheries offices
- Co- management and joint patrols with Cfi and FiAC

Key words: *Increased participation; cooperation and coordination; adaptive management*

2. Geography

The Trapang Ropov fishing ground was formed by two community fisheries (Cfi) located in the trans-boundary area between Preah Sihanouk and Kampot provinces in Cambodia. It is the main fishing ground for local communities who are living in these fisheries communities. The site has various fisheries resources, fish, blue swimming crab, seagrass bed conservation, blood cockle *refugia* and mangrove area. It also has habitat for endangered species like dugong, sea turtles, and sea horses.

The management area of this site is 5,952 ha (mangrove 698 ha, seagrass bed 700ha, blood cockle 102 ha, and blood cockle conservation 15 ha). In 2017 the population of this fishing ground was 2,991 families with 835 house hold involved with fishing (fishers) and 300 fishing boats (long tail boats). The target species are mud crap (*Scylla serrate*), Mackerel (*Rastrelliger spp.*), Anchovy (*Stolephorus spp.*); *Amblygaster spp.* , blood cockle (*Anadara granosa*) and Blue swimming crab (*Portunus pelagicus*).

Fishing gears used in this area include crab trap, mullet gill net, gill net, and push net

It is also major tourist destination, with many developments from private sector occurring (resorts, port and oil industry).

3. Timeline

Year	Event
1980-2001	All fisheries management under Department of Fishery (DoF), at the National level.
2002	Community Fisheries formed by sub-degree and proclamation. It gave the right to Community Fisheries (CFi) to manage and protect fishery resources under supervision from the Fisheries Administration (FiA) and Fisheries Administration Cantonment, (FiAC) and Provincial fishery officers). The CFi sets area of management, responsibilities of various agencies, and regulation of access to fisheries.
2004-2005	A project that focused on governance resources and co-management, which was supported by South China Sea, demarcated seagrass boundary and installed some concrete boxes to prevent trawling in shallow water (seagrass bed)
2006	Declaration of the Fisheries Law
2018-2019	Pilot site for EAFM- The site has EAFM management plan in late 2018 under support from SEAFDEC.

4. Reason why it is a valuable case study

Through EAFM, the site developed a EAFM management plan in late 2018 under support from SEAFDEC. The pan encouraged:

- Joint transboundary management fisheries resource between two provincial fisheries offices
- Co- management and joint patrols with CFi and FiAC

5. Reason why EAFM

Prior to the introduction of EAF, the CFi had been given the powers to manage and protect their fisheries resources, but there was little coordination and cooperation between adjacent CFis and with the government agencies (FiAC and provincial officers). The CFis had been given the responsibilities but without the skills and resources to implement sustainable management.

6. Problems/issues

- IUU fishing still in practice from outside (neighbor country) and from out site CFi.
- Lack of cooperation among stakeholders (before and now)
- Lack of alternative livelihoods (high dependency on fishing)
 - Income from the fishing is low (middlemen set the price of fish catch),
 - Increase number of fishers,

- Lack of selling place for local fish catch product, and
- Activities that need to improve:
 - Participations from relevant agency who are involve with the area to support EAFM
 - Provide more training and activity to support livelihood community fishery (CFi)

7. Results

Through the EAFM planning process, a much more unified vision emerged and stakeholders were able to be involved in setting the objectives and measures to achieve these.

The Management plan that was adopted in late 2018 had a an agreed vision of:

Sustainable Fisheries Resources Management and Enhancement of Livelihood of fishers in Trapang Ropov and Prey Noup 2 Community Fisheries, Tuek Chhou district, Kampot province, and Prey Noup district, Preah Sihanouk province.

The plan had three goals:

- **Goal: Ecology:** Enhancement of fisheries resources and its habitat in Trapang Ropov and Prey Noup 2 Community Fisheries
 - Objective: Rehabilitate critical habitat of fisheries resources and improve fish stocks in Trapang Ropov fishing area
- **Goal: Human:** Improvement of livelihood generation of fisher in Trapang Ropov and Prey Noup 2 Community Fisheries through introduction of alternative livelihood and skill of fisher apart from fishing activity.
 - Objective: Increase income of local fisher from fishing and fisheries related activities
- **Goal: Governance:**
 - Effective law enforcement (fisheries law and instruments, and constitution of community fisheries)
 - Strong cooperation among key stakeholders to engage in management and conservation of fisheries resources, and market of local fish and fisheries product
 - Objective 1: Strengthen law enforcement and cooperation among stakeholders in combating illegal fishing practice within the Trapang Ropov fishing area
 - Objective 2: Enhance human networking to sell local fish and fisheries product

Management actions to achieve these goals included:

Activities to be implemented under objective 1			
1.1 Replant mangrove forest	Area of mangrove forest replantation	15 ha of mangrove forest replantation for 5 years (3 ha/year, 1,000 seeds/ha)	10 ha for <u>Trapang Ropov</u> and 5 ha for <u>Prey Nup 2</u>
1.2 Restore the seagrass bed	Area of seagrass bed restoration/maintenance	- 100 ha of seagrass bed in <u>Prey Nup 2</u> maintained - 200 ha of seagrass bed restored in <u>Trapang Ropov</u> - 6 signboards and demarcated poles	
1.3 Put artificial reef to conservation area	Number of artificial reefs (concrete box, concrete pole)	- 300 poles installed in <u>Prey Nup 2</u> - 100 poles installed in <u>Trapang Ropov</u> - 100 concrete boxes in <u>Trapang Ropov</u>	

Activities to be implemented under objective 2			
2.1 Provide alternative livelihood to fisher (fish source, and dry fish processing)	- Number of fish source group - Number of dry fish group (តាម កម្រិត)	- At least one group of fish sources formed and well operated - At least one group of dry fish formed and well operated	
2.2 Create branding for fish source and dry fish	- Number of Brand for fish source - Number of Brand for dry fish	- One brand for fish source - One brand for dry fish	

Activities to be implemented under objective 3			
3.1 Facilitate with commune council aiming at assist patrol team of CFi	- Strong cooperation between <u>CFi</u> and commune council	- At least one commune council involve in patrol team of <u>CFi</u>	-
3.2 Conduct regular meeting to strengthen cooperation of relevant stakeholders	- Number of stakeholder meeting conducted	- Meeting among stakeholders to strengthen cooperation of relevant stakeholders conducted at least once per month	-
3.3 Joint patrol with relevant stakeholders	- Number of day to joint patrol among key stakeholders	- Joint patrol for 8 days per month	-
3.4 Demonstrate fisheries law and instruments	- Number of fisheries law and legislations	Fisheries law and legislations demonstrated at least one time per month	-
3.5 Conduct awareness raising on importance of fisheries resources in daily living	- Number of awareness raising on importance of fisheries resources in daily living	Awareness raising on importance of fisheries resources in daily living conducted once per month	-

Activities to date have included:

- Production of fish sauce
- Joint patrols and transboundary management between two FiACs
- Mangrove replanting
- Eco-tourism
- Awareness raising
- Installation of a crab bank
- Mari-culture (sea bass)

8. Lessons learnt

1. The EAFM plan identified many activities (including capacity-building and livelihood support), but there is not enough budget to implement (other than the limited support from SEAFDEC and small budget from FiAC)
2. In preparing the EAFM plan (and budget), we must be realistic - only identify activities that are likely to be funded, or have a strong strategy to find the resources to implement the identified activities - otherwise the plan is not going to be implementable
3. Responsibility for implementing the plan lies with CFi, with support of FiAC; other agencies like Fisheries Conservation Department, facilitate technical support. Need to let other agencies (provincial government, Dept of tourism, Dept of environment, private sector etc) know about the plan so that they can also support it.
4. EAFM should to improve in pilot site based on the 3 key principles EAFM - increase to participation, cooperation and coordination and adaptive management.

9. Recommendations for solutions/next steps

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EAFM Planning: Case Study: Philippines - Visayan Sea

1. Abstract

The Visayan Sea is a major fishing ground in the Philippines, and is known to have the highest shore fish biodiversity in the world. The most significant existing management measure is the annual closed season for small pelagics that has been enforced with varying degrees of success since 1939. Even with the closed season, fish biomass has decreased 70% compared to 1950s. There have been many efforts to prepare management plans for the Visayan Sea, but implementation has been hampered by the complexity of multiple political and sectoral jurisdictions. There is no single governance unit; instead there are 3 administrative regions, 5 provinces and 33 municipalities/cities managing parts of the area. In 2010, the provincial governors agreed to cooperate in an attempt to focus management of the area, but it was only in 2017 that the collaboration was formalized through a Covenant. The covenant created management institutions and mandated preparation of a plan. BFAR facilitated the planning process using EAFM as a framework, and using the Mainstreaming EAFM planning and implementation process that BFAR adapted from E-EAFM. The planning process took 2 years from start-up workshop to approval because of the size of the area and the number of stakeholder groups that needed to participate in the process. At present, each province is preparing an implementation plan providing more detailed management actions to be implemented in their respective areas to address their specific concerns. All the provincial implementation plans contribute to achieving the goals and objectives for the whole management area. The management actions are informed by scientific studies on fish stocks that enable the setting of reference points (benchmarks) and harvest control rules (policies/regulations). The harvest control rules are designed to ensure that fishing effort is sustainable, adverse economic impacts of fishing restrictions are minimized, and any re-allocation of fishing rights is equitable.

Key words: *Appropriate scale, science-based management, increased participation, consensus-building*

2. Geography

The Visayan Sea is located in central Philippines. It is a major fishing ground contributing x% to national fisheries production. It has been reported to have the world's highest diversity in shore fishes. It covers 14,000 sq.km., in 3 administrative regions, 5 provinces and 33 municipalities/cities.

3. Timeline

4. Year	Event
1940	Fisheries management mainly by closed season introduced
1950s	70% decline of fish biomass since 1950s to present
2010	Provincial Governors met to focus on Visayan Sea as management area
2017	Governors signed Covenant to create management institutions, prepare a plan
2017	Planning workshops and consultations
2018	Adoption of EAFM plan (called "Management Framework") - (strategy level)
2019	On-going review of closed season, establishment of reference points and harvest control rules (scientific basis for defining rules for sustainable fishing)-

4. Reason why it is a valuable case study

- The case study describes the long process of consensus-building to prepare and adopt an EAFM plan for a large area managed by multiple agencies and political units.
- The participatory planning process used science to inform decision-makers of the status of the resources (overfished) and the impact of proposed actions (reduction of effort= reduction in incomes). The scientific information became the basis for negotiations among stakeholders to develop policies and regulations that conserved the fisheries resources while minimizing the adverse impacts of harvest control rules.

5. Reason why EAFM

- Recommended management actions (based on scientific studies) have serious socio-economic impacts (potentially adverse). EAFM allows balancing of ecological and human well-being.
- The scale of management area requires complex governance that is participatory and considers multiple objectives. Good governance needs to balance the cost of increased participation and management efficiency.
- Science is key to decision-making, but is not the only consideration. It becomes the basis for negotiation and consensus-building. Since data is not always complete, conflicts arise. Stakeholders agree on a precautionary approach in the absence of data.

6. Problems/issues

- Declining fish catch of major target species (small pelagics); existing regulation (closed season) not very effective
- Poverty; inequality in access to fishery resources
- Complex governance challenge (multiple jurisdictions)

7. Results

- Scale is a challenge - solution: creation Visayan Sea institutions (Council), TWG, science advisory group; complicated further by new FMA regulation - now must expand to cover whole FMA-11
- Participatory process - broad stakeholder support, but expensive and time-consuming, requires a lot of consensus-building skills and resources
- Champions were instrumental in creating an awareness and focus of Visayan Sea as a management unit/area; dedicated staff from BFAR and provinces to follow through
- Partnerships - CSOs, development partners, private sector, academe supporting the vision/goals for Visayan Sea with supporting/complementary activities
- Shift to science-based management by integrating the inputs of science advisory group in management decision-making.

8. Lessons learnt

- The challenge of scale - there is no existing political or agency jurisdiction that covers the whole Visayan Sea. The stakeholders had to create Visayan Sea-level institutions: Council, TWG, science advisory group. The sustainability of this approach is uncertain; depends on the continued cooperation and coordination of various agencies and local governments.
- Because of the large scale, meaningful participation is difficult to achieve. However, you need broad stakeholder support for the management plan to be responsive and effective. An extensive participatory process is expensive and time-consuming, and it requires a lot of consensus-building skills and resources. In Visayan Sea, there are many partners supporting the Council to do this. However, there is need for capacity-building for key implementers (personnel in BFAR, local governments) to internalize the “EAFM lens” in their work, so they can continue without dependence on outside support.
- Champions were instrumental in creating an awareness and focus of Visayan Sea as a management unit/area; partnerships - CSOs, development partners, private sector, academe supported the vision/goals for Visayan Sea with supporting/complementary activities
- Shift to science-based management by integrating the inputs of science advisory group in management decision-making. Stock assessment and other research

conducted by BFAR and partners crucial for decision-making as rational basis for negotiating the balance between ecological and human well-being.

9. Recommendations for solutions/next steps

- Need for capacity-building for key implementers (personnel in BFAR, local governments) to internalize the “EAFM lens” in their work
- Need for new approaches for livelihood support for poor fishers that does not increase fishing pressure



Picture. BFAR and 5 Provincial Governors approved the Management Framework for Conservation, Protection and Rehabilitation of the Visayan Sea on September 28, 2018. Behind them is the champion, Atty. Tony Oposa, who has been the catalyst for protecting the Visayan Sea.

Moving towards EAFM: A case study from Hawaii

1. Abstract

This case study demonstrates how one national government, the United States of America (USA) has evolved from conventional fisheries management toward an EAFM through a progression of small steps over the past several decades. It demonstrates that time is needed for this to evolve, applying the lessons learned along the way including increasing stakeholder engagement, broadening scale of management, increasing data and information needs (not just stock assessment), building on existing fisheries management.

The case study focuses on the Western Pacific Regional Fishery Management Council, whose jurisdiction includes the EEZ around the following coastal states (i) Commonwealth of the Northern Mariana Islands (CNMI), (ii) Territory of Guam, (iii) Territory of American Samoa, (iv) State of Hawaii, and (v) seven unincorporated possessions of the USA, including the islands of Howland, Baker, Jarvis and Wake, Johnston Atoll, Palmyra Atoll and Kingman Reef (known collectively as the Pacific Remote Island Areas).

The main steps in the journey were:

- Overfishing leading to collapsing fisheries in the 1950s – 1970s.
- The development of the Magnuson-Stevens Fishery Conservation and Management Act in 1976 that paved the way for improved fisheries management.
- The formation of Regional Councils and single fisheries Fishery Management Plans (FMPs) in the 1980s.
- The adoption of the Sustainable Fisheries Act in 1996 that recognized the importance of conserving and protecting essential Fish Habitat
- The development of a Coral Reef Ecosystem FMP in 2004.
- The evolution of FMPs into Fishery Ecosystem Plans (FEPs) in 2010
- End of 'overfishing' for all USA fishery stocks in 2012 and the rebuilding of stocks

Key words: *Legislation; policy; EAFM planning; EAFM principles*

2. Geography:

The case study focuses on the Western Pacific Regional Fishery Management Council, whose jurisdiction includes the EEZ around the following coastal states:

1. Commonwealth of the Northern Mariana Islands (CNMI)
2. Territory of Guam
3. Territory of American Samoa
4. State of Hawaii
5. Seven unincorporated possessions of the USA, including the islands of Howland, Baker, Jarvis and Wake, Johnston Atoll, Palmyra Atoll and Kingman Reef (known collectively as the Pacific Remote Island Areas)

3. Timeline

Year	Event
1950s – 1970s	Overfishing → Collapsing fisheries
1976	New Conservation & Management Act -Magnuson-Stevens Fishery Conservation and Management Act
1980s	Regional Councils and single fisheries Fishery Management Plans (FMPs)
1996	Sustainable Fisheries Act → Essential Fish Habitat
2004	Coral Reef Ecosystem FMP
2010	Fishery Ecosystem Plans (FEPs)
2012	End of 'overfishing' for all USA fishery stocks- Rebuilding of stocks

4. Reason why it is a valuable case study

This case study demonstrates how one national government, the United States of America (USA) has evolved from conventional fisheries management toward an EAFM through a progression of small steps over the past several decades. The case study shows how management laws and policies have evolved toward an EAFM and uses the case studies to show how the EAFM principles are increasingly being adopted into fisheries management (highlighted below).

5. Reason why EAFM

Following the collapse of fisheries around the globe and in the United States in 1976, the USA Congress declared that a national program for the conservation and management of the fishery resources of the USA was necessary to prevent overfishing, rebuild overfished stocks, ensure conservation and realize the full potential of the nation's fishery resources. This declaration resulted in the passage of the Magnuson-Stevens Fishery Conservation and Management Act of 1976, the primary law governing marine fisheries management in the USA from three to 200 nautical miles from shore. While fisheries management under the Magnuson-Stevens Fisheries Act of 1976 was transformational and represented a shift toward an EAFM, it was still much more aligned with single species or sectoral fisheries management approaches.

The Sustainable Fisheries Act of 1996, paved the way for the formation of the Western Pacific Regional Fishery Management Council developed and NOAA adopted a Coral Reef Ecosystem FMP in 2004 as a proactive step to more effectively manage extraction of coral reef resources if fisheries expanded beyond three miles from shore. However, this was not yet an ecosystem approach.

In 2009, the Western Pacific Regional Fishery Management Council re-organized the management programs from the above five species/taxa-based Fishery Management Plans to five Fishery Ecosystem Plans (FEP) to provide a place-based framework that better

integrates taxa across ecosystem components. Hence, this was another step towards an EAFM for each geographic/archipelagic area under the Council's jurisdiction

6. Problems/issues

- Collapsing fisheries in 1976
- Little conservation of habitat until 1996
- Management based on single-species stock assessments until 1996
- Management areas too narrow to take in ecosystem considerations
- Multitude of Fisheries Management Plans, but not holistic Fishery Ecosystem Plans until 2010.

7. Results

Increased participation and better cooperation and coordination was achieved through the establishment of 8 Regional Fisheries Management Councils around the USA in 1976 to advise the government (NOAA) on fisheries management issues and develop and amend Fisheries Management Plans to maintain fishing opportunities while conserving marine resources and habitats.

The voting members of the Council includes people from

- Key Federal agencies (NOAA, U.S. Fish & Wildlife Service, US Coast Guard, and State Department)
- State fisheries agencies
- Fishermen (commercial and recreational)
- Other key fisheries stakeholders (seafood industry, conservationists, researchers, educators, etc.)

The Sustainable Fisheries Act of 1996, 20 years after the original Magnuson-Stevens Act, represented a significant shift toward an EAFM. The 1996 Sustainable Fisheries Act required the consideration and protection of Essential Fish Habitats in the Fishery Management process. It was an important legislative shift towards EAFM

- reduce bycatch
- protect essential fish habitats
- to consider the effects of management decisions on communities.

The next major step was the development of a Coral Reef Ecosystem FMP in 2004, which was a shift from target to multi-species, multi-scale fisheries. For example, the Western Pacific Fisheries Management Council developed and NOAA approved the first ecosystem-based fishery management plan for coral reefs of the U.S. Pacific Islands. It includes:

- Multi-species fisheries (2,000+ species)
- Multi-gear fisheries (25+ methods)
- Occurs across national, state and territorial waters

The Coral Reef Ecosystem FMP included Ecological Well-being Objectives, Human Well-being Objectives, and Good Governance Objectives so clearly sought to address the 3 Components of an EAFM. The plan uses the precautionary approach and adaptive management. The Plan also included objectives to establish research, monitoring, data collection and permitting to improve adaptive management decision-making.

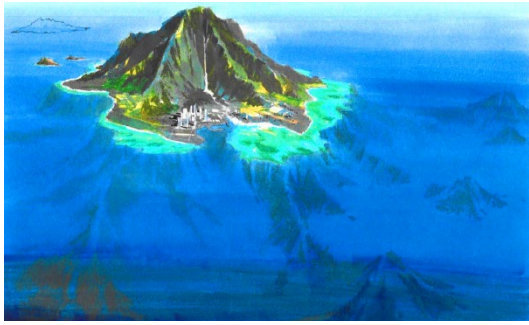
In 2010 Fishery Ecosystem Plans (FEPs) were developed for 5 area-based (i) Mariana Archipelago, (ii) Pacific Remote Islands, (iii) American Samoa Archipelago, (iii) Hawaiian Archipelago and (iv) Pacific Pelagics.

Finally, in 2012 the end of “overfishing” in all USA stocks was declared.

8. Lessons learnt

EAFM is a step by step process; apply lessons learned along the way including:

- increasing stakeholder engagement
- broadening scale of management
- increasing data and information needs (not just stock assessment)
- building on existing fisheries management



Key principles of EAFM



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Scaling up EAFM: Case Study of the Sulu Sulawesi Seascape Sub-regional EAFM Plan

1. Abstract

The case study demonstrates adopting the EAFM planning process (Steps 1 to 3) in developing a sub-regional EAFM plan to manage transboundary fisheries. It also demonstrates the role of scale within an EAFM for the Sulu Sulawesi seascape and the nested approach to fisheries management planning and linking with international/regional as well as national and local fisheries management plans:

The Sulu Sulawesi Seascape sub-region is geographically defined as the waters encompassed by the SSME, a marine area of over 900,000 square kilometers, bounded among three nations: Indonesia, Malaysia and the Philippines.

The planning process resulted in a EAFM Plan for the Sulu-Sulawesi Seascape sub-region that included a vision, goals, objectives *“By 2030, the transboundary fisheries of the Sulu Sulawesi Seas are ecologically healthy and deliver ecosystem services that provide equitable benefits to our people through collaborative, safe, and legal regional fisheries management.”*

The EAFM plan calls for an immediate focus on five species of economically-important, transboundary small pelagic fisheries and a longer-term focus on seven target species of economically-important, transboundary large pelagic and neritic tuna fisheries, as well as six target species of coral reef-associated transboundary fish species.

Following the EAFM framework, the Sulu-Sulawesi Seascape Sub-Regional Plan includes three goals and 18 objectives covering the three components of EAFM – ecological well-being, human well-being and governance. A mixture of existing national, multinational and proposed new management actions was agreed.

The proposed governance mechanisms were: the CTI Sulu-Sulawesi Seascape Sub-committee on Fisheries; or Similar structure such as the Tri-National SSME Committee.

Keywords: *Sub-regional EAFM planning; Scaling EAFM.*

2. Geography

The Sulu Sulawesi Seascape sub-region is geographically defined as the waters encompassed by the SSME, a marine area of over 900,000 square kilometers, bounded among three nations: Indonesia, Malaysia and the Philippines. It is a key area for regional fisheries production, food security, economic development in Southeast Asian region. It is also a priority area for biodiversity conservation, and one of the priority seascapes in the Coral Triangle

Shared boundaries, ecosystem dynamics and resources, environmental issues (between and among Indonesia, Malaysia and the Philippines)

3. Reason why it is a valuable case study

The case study is an example of adopting the EAFM planning process (Steps 1 to 3) in developing a sub-regional EAFM plan to manage transboundary fisheries. It also demonstrates the role of scale within an EAFM for the Sulu Sulawesi seascape and the nested approach to fisheries management planning and linking with international/regional as well as national and local fisheries management plans:

- International: FAO Code of Conduct of Responsible Fisheries (CCRF)
- Regional: CTI-CFF Regional Plan of Action (*specifically EAFM Goal*)
- National/Local: National Fisheries Policies; Sub-national/local area plans (*fisheries, conservation, etc.*)

4. Reason why EAFM

The Sulu Sulawesi Sea marine resources are shared by Indonesia, Malaysia and the Philippines. Although each of these countries are moving towards EAFM, there has been little attempt to coordinate and collaborate to address the transboundary nature of the issues and threats to sustainable fisheries.

The ecosystem approach can be applied at a number of geographical and jurisdictional levels, and provides a holistic framework to address transboundary issues.

4. Problems/issues

As with many seas in SE Asia, the main issues are:

- Overexploitation of marine living resources
 - Excessive by-catch
- Degradation of habitats and marine biodiversity
 - Impacts of fishing
- Social and economic concerns
 - Low incomes
 - Low community resilience
 - Inequitable benefits
 - Unstable food security
- Weak governance
 - IUU fishing
 - Inadequate regional MCS
 - Inadequate judicial and enforcement capacity
 - Weak stakeholder participation
 - Weak regional coordination

5. Results

The planning process resulted in a vision to guide the ecosystem approach to fisheries management (EAFM) within the Sulu-Sulawesi Seascape sub-region: *“By 2030, the transboundary fisheries of the Sulu Sulawesi Seas are ecologically healthy and deliver ecosystem services that provide equitable benefits to our people through collaborative, safe, and legal regional fisheries management.”*

Following the EAFM framework, the Sulu-Sulawesi Seascape Sub-Regional Plan includes three goals and 18 objectives:

- Ecological - Goal #1: Improved long-term health of living marine resources and their habitats through responsible regional fisheries management for optimal benefits to our communities.
 - Objectives
 - Maintain optimal/sustainable exploitation rates
 - Maintain suitable water quality
 - Restore habitat and conserve marine biodiversity
 - Control by-catch
 - Minimize negative fishery impacts
 - Increase science and information
- Human Wellbeing - Goal #2: Resilient, self-reliant, and empowered communities who benefit from inclusive, just, responsible, and economically- and socially-equitable fisheries management.
 - Objectives
 - Enhance income
 - Improve community resilience
 - Improve human well-being (legal, just and equitable)
 - Equity and social benefits for all
 - Enhance and stabilize consumption (food security)
- Governance - Goal #3: Improved governance and transboundary fishery policy capacity through a coordinated regional framework that is effectively implemented through a participatory, responsive, transparent, and adaptive process.
 - Objectives
 - Reduce IUU fishing
 - Strengthen capacity (sustainable fisheries)
 - Climate adaptation and mitigation
 - Strengthen regional MCS
 - Improve judicial and enforcement capacity
 - Enhance stakeholder participation
 - Strengthen regional coordination

Management actions to achieve these objectives included:

- Maintenance of national sovereignty with guidance through the sub-regional plan

- Three types of management actions
 - Current national (i.e. country ‘contributions’)
 - Current multinational (e.g. CTI-CFF,RPOA)
 - Proposed (new) management actions (e.g. GEF7)

The EAFM plan calls for an immediate focus on five species of economically-important, transboundary small pelagic fisheries and a longer-term focus on seven target species of economically-important, transboundary large pelagic and neritic tuna fisheries, as well as six target species of coral reef-associated transboundary fish species.

During October and November 2018, on behalf of the CTI-CFF Regional Secretariat, USAID Oceans socialized the plan with National CTI Coordinating Committees (CTI NCCCs) and stakeholders in Indonesia, Malaysia, and the Philippines. The finalized version of this plan was presented at the 14th CTI-CFF Senior Officials’ Meeting, December 9-15, 2018, at which the six Coral Triangle member countries jointly endorsed the plan.

The proposed governance mechanisms were:

- CTI Sulu-Sulawesi Seascape Sub-committee on Fisheries; or Similar structure such as the Tri-National SSME Committee

6. Lessons learnt

Collaborative, multi-national, multi-stakeholder process development process took four-year (2015-2018) with critical support roles of regional institutions, programs and working groups. The Sub-Regional Plan required a collaborative, multi-national, multi-stakeholder process. Coordination and cooperation of various government levels and multiple sectors.

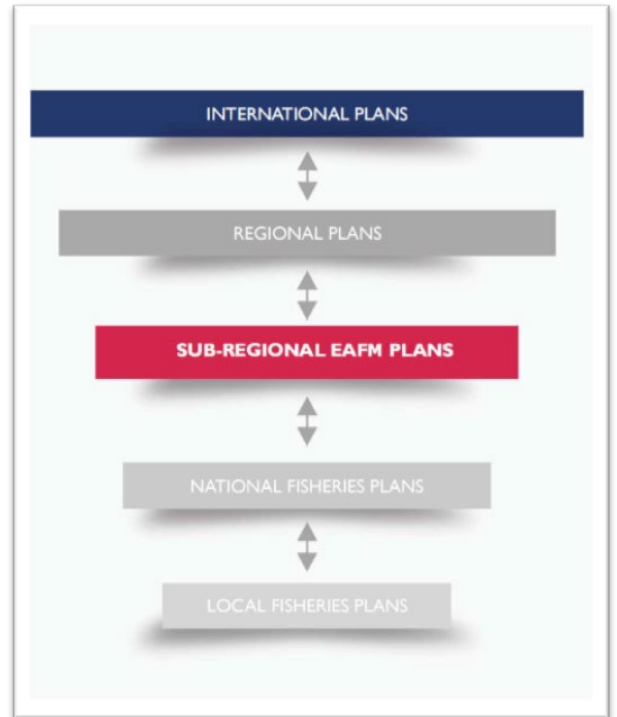
Socialization of the sub-regional plan with CTI Regional Secretariat and National Coordinating Committees, other partners was need to review and secure buy-in.

Sulu-Sulawesi Sea members, Malaysia and Philippines also committed to adopt and implement the plan in 2019. It was built upon past and existing related fisheries management efforts e.g., SSME, ECP, SAP, others, including:

- Ecoregion Conservation Plan (ECP) for the Sulu-Sulawesi Marine Ecoregion (2003)
- Comprehensive Action Plan for SSME (2011)
- SSME Regional Strategic Action Program (2013)

7. Recommendations for solutions/next steps

Some challenges still remain on the scaling of EAFM beyond national jurisdictions (e.g., sovereignty and sovereign rights), and the implementation of management remains to be with the national fisheries agencies.



Monitor, evaluate and adapt: A case study for the marine fisheries in the Gulf of Thailand

1. Abstract

This case study demonstrates the importance of an independent assessment of the performance of management actions contained in a Fisheries Management/EAFM Plan (FMP). Following a period of severe overfishing, coupled with illegal, unregulated and unreported (IUU) fishing and habitat degradation, the Thai Government undertook a number of reforms starting with a new Fisheries Law - Royal Ordinance on Fisheries B.E. 2558 (2015) and its amendment in B.E 2560 (2017). The introduction of the new law was facilitated by a new FMP that followed an ecosystem approach to identifying and addressing key threats and issues.

Progress towards meeting the goals and objectives of the FMP were assessed by comparing the agreed indicators against their stated benchmarks. Many of the management measures specified in the FMP had already been implemented. Excellent progress was made against the urgent issues of (i) overfishing and overcapacity, and (ii) IUU fishing. For the other less urgent issues, good progress has been made against all objectives.

The evaluation was used to inform an update and revision of the FMP. As well as realising how important monitoring, evaluating and adapting is to the EAFM process, the evaluation also revealed some deficiencies in the monitoring process, especially in terms of coordination and cooperation across different agencies.

Key words: *Monitoring and Evaluation (M&E); Adaption*

2. Geography

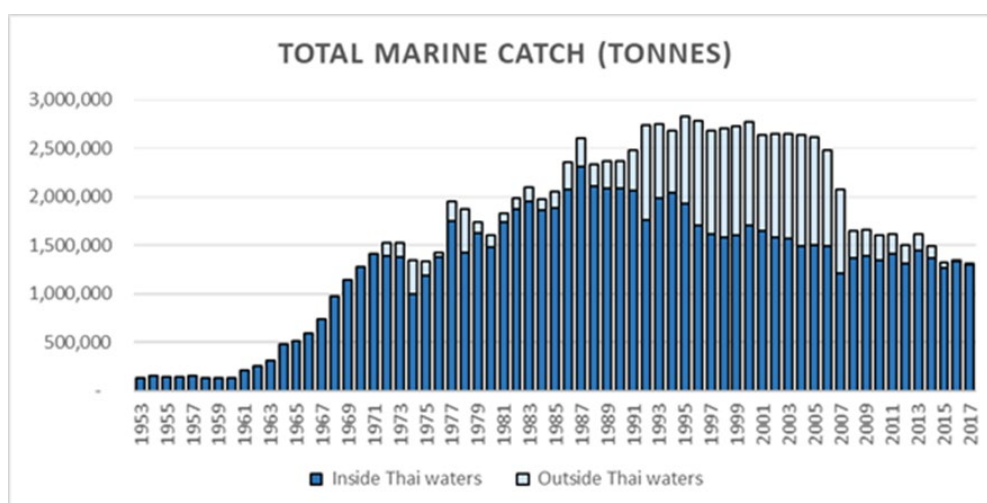
The case study covers the marine capture fisheries taken by both artisanal and commercial vessels in Thai waters (including the territorial waters out to 12nm and the Thailand exclusive economic zone (EEZ) of the Gulf of Thailand (GOT).

3. Timeline

1947	Fisheries Act (1947) provided the basics for managing Thailand's fisheries, 1947 through to 2015
1960s	Trawling and purse seining introduced into the GOT
1970s	Rapid expansion of fishing effort (both boats and technology) in the GOT
1980s:	Declining fisheries resources in GOT forced Thai vessels further offshore and into neighbouring waters
Late 1990s	Declaration of neighbour's EEZs resulting in joint ventures
2008 -2015	Indonesia, Malaysia, Myanmar and Papua New Guinea blocked access to Thai vessels

2015	New Royal Ordinance on Fisheries B.E. 2558 (2015) and its amendment in B.E. 2560 (2017) lead to a number of reforms, including a transition to a limited access fishery and reduction in fishing effort
2015	Thailand Marine Fisheries Management Plan (FMP) (2015-2019) developed based on EAFM principles
2019	First evaluation of the performance of the FMP (2015-2019)
2019	A revised FMP (2020-2025) was developed based on the evaluation

The following figure shows the total marine catch for Thailand from 1950 to 2017. Four developmental phases can be clearly seen (i) rapid increase in catch from 1960 until the late 1970s, (ii) stagnating of catches in Thai waters during the 1980s, (iii) the increase in offshore catch from the mid-1980s until the mid-2000 and (iv) the reduction in offshore catch in the later part of the 2000 decade, following access denial of neighboring countries.



4. Reason why it is a valuable case study

The case study demonstrates:

- An independent evaluation of a fisheries management plan (EAFM plan) as required as part of the EAFM Management Cycle
- The importance of indicators and benchmarks
- An ability to adapt a FMP based on the evaluation of performance of management (Step 5 of the EAFM Management Cycle)

5. Reason why EAFM

Previous fisheries management under an open-access regime, which just considered fisheries resources issues, was not effective. The development of a FMP based on threats/issues and their root causes that covered the three components of EAFM

(ecological, human and governance) formed the basis of setting goals, objectives (with indicators and benchmarks) and management action.

Having agreed indicators and benchmarks greatly facilitated the evaluation of management performance by assessing the progress towards achieving the goals and objectives/

6. Problems/issues

The threats and issues that were identified covered the ecological, human and governance dimensions of EAFM.

The priority issues were:

- Overfishing, especially by the commercial fleets
- Illegal, unreported and unregulated (IUU) fishing
- Degraded critical habitat
- Conflicts between artisanal and commercial fishers
- Catching a large quantity of juvenile fish of larger commercial species
- Inadequate fisheries data and information
- Inadequate fisheries management capacity

A problem tree analysis was carried out to identify the causes of the issues and objectives, indicators and benchmarks were developed. The performance evaluation was based on comparing the indicator status with the benchmark (Step 5 of the Management Cycle)

7. Results

Many of the management measures specified in the FMP had already been implemented. Based on a comparison of the current status of each indicator against its stated benchmark, it was found that excellent progress was made against the urgent issues of (i) overfishing and overcapacity, and (ii) IUU fishing. For the other less urgent issues, good progress has been made against all objectives (see the following traffic light presentation of the results).

Target reached	Good progress	No progress
Goal and objective		Assessment
Goal: Reform Thailand's marine fisheries to a limited access regime where the fishing effort is commensurate with the MSY		
Objective: Reduce fishing capacity and fishing effort		
Objective: Rebuild fish resources through artificial reefs and restocking programs		
Objective: Reduce the catch of juveniles of the larger commercial species		
Goal: Prevent, deter and eliminate IUU fishing		
Objective: Minimize IUU fishing through effective MCS		
Goal: Increase benefits for and reduce conflicts among major stake holders		
Objective: Resolve conflicts between small-scale and large-scale fishers		
Goal: Improve the marine environment		
Objective: Restore and maintain critical habitats		
Goal: Strengthen capacity to sustainably manage fisheries		
Objective: Improve fisheries data and information		
Objective: Strengthen fisheries management capacity		

8. Lessons learnt

An independent evaluation against the indicator was important to inform the revision of the new FMP (2020-2025). However, the evaluation was not straight forward because:

- Not all the indicators specified in the FMP were monitored
- Monitoring of some indicators was the responsibility of other agencies and there was inadequate coordination and cooperation
- Scientific analyses of the results required a broad base of technical skills

9. Recommendations for solutions/next steps

Recommendations for future M&E:

- EAFM planning needs to ensure that the agreed indicators are being monitored
- Independent assessors need to be identified and trained

