

Coastal Fisheries Management towards the Rehabilitation of Small-scale Fisheries: the Case of Phang-nga Bay, Thailand

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1. Introduction

The implementation of coastal resource management is a priority basis. The implication of well-managed coastal resources is to secure small-scale fishers an employment opportunity. Similarly, the small-scale fishers are important resource users to functionally manage coastal resources. In short-run, this is to sustain the fishers both way of lives and livelihoods. In long-run, this is to obtain resilience of the coastal resource [1].

In Thailand, the practice of coastal resource management was handled with top-down approach from 1961 to 1994. In 1995, the central government adopted the bottom-up approach to promote policy and program of political and administrative decentralization in nationwide [2]. The government devolves its authority which concerns administrative work, social welfare and environmental management responsibility [2] and [3]. This decentralization of authority is transferred to local government level which lines down from provincial, district to sub-district. Particular sub-district administrative organization is a key management body at local level.

Practiced bottom-up approach in fisheries sectors, the Department of Fisheries (DOF) adopted community-based fisheries management (CBFM) approach for coastal resource management. This approach fundamentally requires particular small-scale fishers' participation. The 1997 Constitution and Public Administrative Decentralization Act is legal framework to contribute a practice of fishers' participation in community development and resource management.

The Department of Fisheries (DOF) implemented the national small-scale fisheries development policy and program. This policy and program was under the framework of the Seventh (1992–1996) and the Eighth (1997–2001) National Economic and Social Development plans. These two national plans targeted small-scale fishers in the whole country. Small-scale fishers mean fishers used vessels of less than 5 gross tons and operate fishing in coastal areas (zone 1) [4].

Number of small-scale fishers in the Phang-Nga Bay amounted to 90% of small-scale fishers in Thailand [5]. In addition, these small-scale fishers were defined poor. Their average monthly income was not sufficient to meet household basic needs [6]. The DOF implemented the national small-scale fisheries development program into the bay. This program composed of two approaches. One was fisher participatory approach to progressively manage coastal resources. Livelihood approach was secondly to mainly improve fishers' household economy and standard of living. The DOF was together with the FAO/ Bay of Bengal Program's technical support provided several preparatory activities to train small-scale fishers participated in coastal resource management.

Thousand of small-scale fishers live along the Phang-Nga exacerbated by the tsunami devastation in December, 2004. The tsunami damage caused people and fishers lost their lives which were reported by domestic government agencies and international development organizations. Hundred of fishers lost their fishing gears and fishing boats. Some lost fish cages. These caused to unstable fishers' livelihood and reduction of capacity in fishing. Non-stability of fishers' livelihood is major cause to probably bring slowdown in fishers' participation in coastal resource management.

To alleviate a slowdown of fishers' participation in coastal resource management, the DOF formulated the nation relief policy and program with the concept of responsible fisheries and sustainable development. Certainly, it puts the rebuilding capacity of fishers as major priority. This is to rapidly resume fishers' capacity in fishing as one hand. On the other hand, this is to reduce unstable fishers' livelihood.

The content of this paper consists of the background of the small-scale fisheries development program implemented in particular Klongkian Sub-district in Phang-Nga Bay, Phang-Nga province. This program was significant to contribute the development of fishing community and coastal resource management at pre-tsunami. The implication of the program affirms that small-scale fishers have long experience participated in coastal resource management. A basic governance structure of fishing community, which is simply explained, is crucial mechanism to support fishers' participation. Fishers' group and its institution are placed high priority. The group is village-based body to implement the small-scale fisheries development program. This group is playing a key role to practice in coastal resource management.

At post-tsunami, fishing households lost capacities in fishing operation is described towards socio-economic data of those fishing household. The rehabilitation of fishing household is clarified with relief activity implementation. Financial assistance are

important to encourage fishers earlier rebuilt their capacity in fishing. Several sources of financial assistance provide fishers an activity to facilitate those fishers for working in group. Then, fishers' group and organization function well to ahead carry on sustainable coastal resource management.

2. The scope of the study

The objective of the study is to identify the loss and damage of fishers by tsunami devastation. The second objective is to classify relief programs and stakeholders contributed to the rehabilitation of fishing community. The last objective is to view the implication of the relief programs facilitated to develop fishers' participation and to increase the opportunity of local government body development. This implication is viewed towards fishers as well as local government body practicing in coastal resource management.

Klongkian Sub-district, Thakautung District, Phang-Nga Province composes of eight villages (see fig. 1). More than fifty percent of eight villages are small-scale fishing villages. These amounts of fishing village have long experience participated in both national and international collaborative projects for the resilience of coastal resource and management. These fishing villages have dealt with the concept of responsible

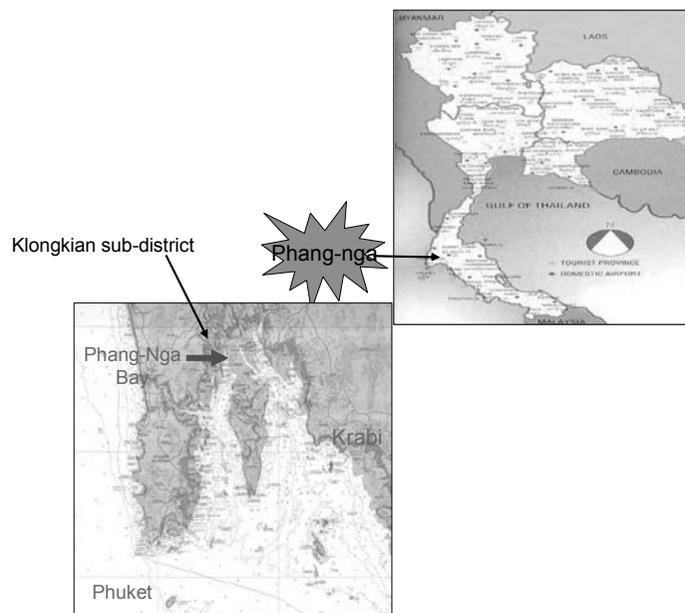


Fig. 1 Map of Klongkian Sub-district locates in Phang-Nga Bay

fishing before 1995. After then, the villagers have been put to practice in the concept of responsible fishing combining with community-based fisheries management approach for achieving sustainable coastal resources.

The small-scale fishers of two sampled villages of this sub-district are as remunerators. They are the representatives of fishers damaged by tsunami and lost only physical fishing assets, not lost their lives. Data collection was done through surveys with interviewing the remunerators. The questionnaire was designed to collect data on how fishers rehabilitate the fishing asset and capacity, what source of financial assistance and purpose of financial assistance use. These findings of the surveys affirm fishers resumed their way of life and livelihoods. The analysis of the data collection is done by descriptive analysis with figuring out mean value of the data.

3. Background of the study site

1) The foundation of the Klongkian Sub-district

The Phang-Nga Bay has boundary area of about 3,000km². The mangrove forest areas cover 1,900km² of the Bay [7]. The Klongkian Sub-district locates along the abundance of mangrove forest areas (see fig. 2). The jurisdiction of this sub-district has 131km² shown in table 1 [8]. Total population is 4,646 in July, 2005. This number of population composes of 4,539 (97.7 percent) who are Muslim habitants. Number of working population is 2,426 with age of 15-59 year olds. Top-three occupations are farmer in agriculture (1,097 persons, 45.22 percent), fishers (349 persons, 14.39 percent) and labor (594 persons, 24.48 percent).

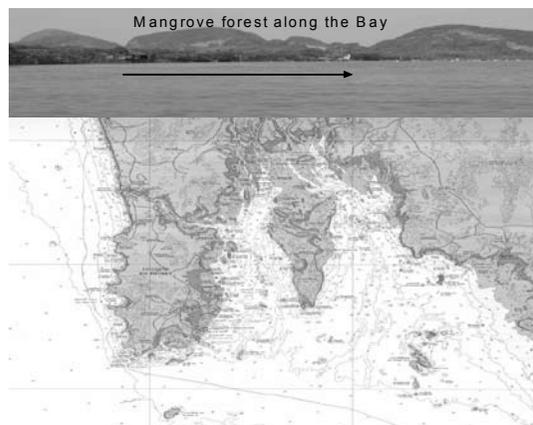


Fig. 2 A surrounding of mangrove forests along Klongkian Sub-district in Phang-Nga Bay

Table 1 The profile of population and geographic of Klongkian Sub-district

Items	number	%
1. Territorial area (km ²)*	131	
2. Total population (persons)**	4, 646	100
3. Religion: Muslim**	4, 539	97. 7
4. Occupation**		
- farmer in agriculture	1, 097	45. 22
- fisher	349	14. 39
- labor	594	24. 48

Remark: * <http://www.dopa.go.th/local/phangnga44.htm>

** Klongkian Sub-district Administrative Organization Office, July 2005

In fisheries sector, fishers are small-scale fishers and fish-farmers. Small-scale fishers use long-tailed boat (outboard powered boat) and traditional fishing gear. Small-scale fish-farmers engage in both capture fisheries and coastal aquaculture. Generally, a fisher uses multi-type of traditional fishing gear. Type of the fishing gear use is shrimp trammel net, crab gill net, fish gill net, fish traps, etc. Shallow water set net is a main type of traditional fishing gear. This fishing gear chiefly targets shrimps. Fish caught by shallow water set net is used as bait fed for fish cage cultures. Fishing gear operational changes depend upon fishing season. A change of fishing season is mainly affected by the southwest and northeast monsoons.

2) Governance structure and administrative function

The Klongkian Sub-district Administrative Organization (Ongkarnborihan-suantambol, Ao.Bo.To. in *Thai*) was established in 1996 [8]. This Ao.Bo.To. was established after the 1994 Sub-district Administrative Organization Act. The Act had been effective since 1995 [9]. Generally, the Ao.Bo.To. Council has to make across-sector communication among village, district office and higher-ranking office. The Ao.Bo.To. Council is a task force to implement both top-down and bottom-up approaches. Implementing top-down approach, it has to follow and practice a policy and assignment coming from district office and central government. Practicing in bottom-up approach, the Ao.Bo.To. Council has main function to take responsibilities on providing basic need and welfare of the community, self-management on budget and finance. In addition, the Ao.Bo.To. Council

has a duty to manage local resource base on its owned jurisdictions. Its duty dealt with resource management has to adopt people participatory approach. This follows the legitimate of the 1997 Constitution.

The Klongkian Sub-district Administrative Organization (Ao.Bo.To.) has an annual income of less than three million bahts [8]. The Klongkian Ao.Bo.To is ranked on Class V. The Ao.Bo.To. Council composes of sixteen representatives. These representatives are elected from eight villages. Each village has two representatives. This Council has to formulate a five-year community development plan according to the Ao.Bo.To. Act, 1994. The plan is placing an emphasis on the community infrastructure construction such road construction in each village. The Klongkian Ao.Bo.To. Council has put the activities of local resource base management low on the community development plan.

3) Fishers' participation in coastal resource management

Recently, the Klongkian Ao.Bo.To. has low experience in coastal resource management. Fishers' group has long experience in community development and resource management before the establishment of the Klongkian Ao.Bo.To.. The Department of Fisheries (DOF) implemented the national small-scale fisheries development program to fishing communities in Klongkian Sub-district. This program was under the Seventh National Social and Economic Development plan (1992-1996). The small-scale fisheries development program consisted of two objectives. One was to increase fishers' participation in responsible fisheries. Other one was to develop fishers practicing in community-based fisheries management.

The implication of fishers' participation in responsible fisheries was the stop of using push net fishing gear in coastal areas of the Phang-Nga Bay [10]. The DOF adopted livelihood approach with an increase of responsible fishing gear and aquaculture. The livelihood approach was to secure fishers earning income. This approach is conducive to forward fishers' participation in responsible fisheries. The DOF gave a set of gill net fishing gear to push net fishers. The DOF also introduced push net fishers and other fishers to engage in coastal aquacultures. The DOF provided technical assistance, fish cage and fish fingerlings to push net fishers and other fishers.

To increase fishers participated in coastal resource management, the DOF implemented several coastal resource management activities. These activities were such mangrove reforestation, fish fingerling releasing, stocking cage for gravid crab. Fishers practiced in these activities explicitly enhancing an abundance of coastal resource.

Meanwhile, fishers had been personally aware of important resource management.

The DOF suggested fishers to establish a fishers' group. The outstanding activity of this fishers' group is managing an auction particular shrimp products. This fishers' group initially handles the auction on shrimp product with the suggestion of the Andaman Sea Fisheries Development official, the Department of Fisheries. After a few year passed, the shrimp auction activity is well-known and well-operated by both inside and outside fish traders and collectors. The auction is regularly operated every two days, nowadays. Shrimp trammel net, crab gill net and shallow water set net fishers receive a benefit come from the auction. They themselves are acknowledgeable the value of marketable sized shrimps. The auction activity is marketing strategic driven responsible fisheries. The fishers' group is a key working unit at village level. It leads its member and other stakeholders to practice in responsible fisheries for sustainable coastal resources and management.

4) The link of sub-district and village management bodies

Two key local management bodies are Sub-district Administrative Organization and fishers' group at local level. They are assumed to share working to achieve a well-managed resources and a well-developed community. Table 2 illustrates the three-year community development plan with specific strategy and objective. This plan was formulated by the Klongkian Sub-district Administrative Organization (Ao.Bo.To.) Council. The plan has annual tentative schedule to conduct mangrove reforestation.

Shown by the three-year plan, the link of between fishers' group and the Klongkian Ao.Bo.To. Council has placed the concern low on the working in coastal resource management. The linkage of between the Klongkian Ao.Bo.To. Council and the fishers' group occasionally depends upon a conduct of mangrove reforestation activity. This link is not numerous because of two major limitations. One hand, there is no fisher elected to be member of the Ao.Bo.To. Council. The Council members are engaging outside fisheries sector. These members put high priority on infrastructure construction, community welfare management. But, they put low priority on coastal resource management. On the other hand, capacity of fishers' group and fishers' participation in coastal resource management is marginalized.

The practice of the Klongkian Ao.Bo.To. Council and the fishers' group are especially shared working in coastal resource management according to the three-year plan. This practice is the implication of a gap between decentralization of authority policy and

Table 2 A three-year community development plan (2006–2008) for the Klongkian Sub-district Administrative Organization

Strategy 4: Resource management and environmental development

Objective: To increase people's awareness on resource management and environmental development

Project	2006	2007	2008
Mangrove reforestation in four villages	1-time	1-time	1-time
Buoy installation for marking fishing ground areas	1-place	-	-
Training arrangement on a using of responsible fishing gear	1-time	1-time	-
Mangrove forest conservation	1-time	1-time	1-time
An annually increase of mangrove reforestation area	1-time	1-time	1-time
Community reforestation for every village	1-time	1-time	1-time

Source: Klongkian Sub-district Administrative Organization Office, July 2005

implementation. This means that the decentralization of authority towards the Sub-district Administrative Organization is not fully functional yet to contribute fishers holistically managed their local resources on its owned boundary areas. The Klongkian Ao.Bo.To. Council does not yet use its legislative power to safeguard and encourage traditional coastal resource management activities.

Fishers' group and fishers self-manage their fishing ground with their customary use particular in the settlement of shallow water set net and fish cage culture. This fishers' self-management on fishing ground is active without the Ao.Bo.To. Council's legislative approval. This management is conventionally based on kinship, friendship and mutual help since previous days.

Fishers' group is still taking a key and leading role to keep fishers' participation in coastal resource management. The group makes connection and network with fishers' group at adjacent fishing villages. The fishers' group is core unit connected with the DOF and non-governmental organizations to chiefly handle resource management activities.

4. Tsunami devastation to fisheries sector

In December, 2004, Tsunami severely affected Phang-Nga province. This devastation destroyed 308 villages in 79 sub-districts of 24 districts in the province [11]. Eight fishing villages of the Klongkian Sub-district were also exacerbated by the gigantic wave. Fishers and other villagers did not lose their lives. These local people cited that mangrove forest was as natural wave breaker. The forests helped reducing a severe destruction of the wave. However, this wave wrecked fishing assets such stationary fishing gears, fish cages and boats.

Fig. 3 presents a fishing household lost fishing asset by tsunami devastation. This chart visually displays categories of fishing asset belonging to fishing households. Basically, each bar indicates fishing households possessed type of asset in fisheries. Taking a look at shallow water set net bar, this bar composes of four types of fishing household lost their assets. They are fishing households certainly lost shallow water set net coupled with crab gill net (21%) or crab trap (25%) or grouper trap (25%) or boat and engine (24%). On categories of fish cage culture bar, fishing household lost fish cage culture only (33%), with indo-pacific mackerel gill net (14%), crab trap (35%) and boat and engine (18%). Other bars are crab gill net and indo-pacific mackerel gill net fishing households. Both of these types are destroyed boat and engine (100%) for each. Similarly, the bar of crab trap fishing household lost with fish cage culture (100%).

Categories of the fig. 3 are elementary types to assume a lost value of fishing asset in fishing households. Fig. 4 shows fishing households lost fishing asset in value by tsunami destruction. Similar categories of fishing asset are as the categories of fig. 3. Each category is a comparison between values at pre-and post-tsunami. This chart illustrates that traditional fishing gears are completely destructive by the wave. Each category lost amounted to 9,350 baht of shallow water net, 5,500 baht of crab gill net, 9,463 baht of shrimp trammel net, 7,250 baht of indo-pacific mackerel gill net, 3,150 baht of crab trap. Category of boat and engine is visually indicated a part damage of boat and engine. The value of partly damaged boat and engine is costly amounted to 22,940 baht at post-tsunami. Fish cage culture bar is also completely lost which is amounted to 59,363 from 59,818 baht of pre-tsunami.

Traditional fishing gear is completely lost and boat and engine is partly damaged. These become a serious cause to fishers and fish-farmers. They have no capacity engaged in capture and coastal aquaculture. There is no fishing operation, and then fishers' group cannot handle an auction of shrimp price. This cause fishers and fish-

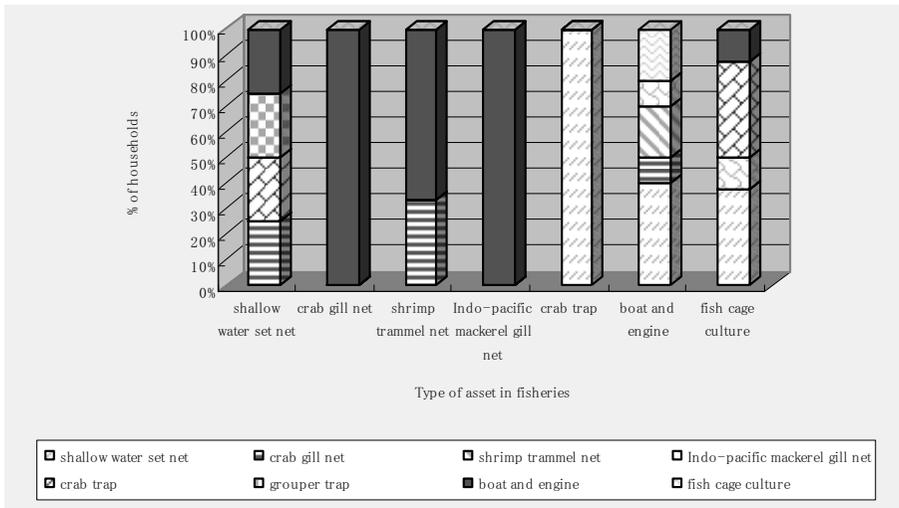


Fig. 3 A fishing household lost assets in fisheries sector by Tsunami devastation

Source: Data collection and village survey conducted in Klongkian Sub-district, June, 2005

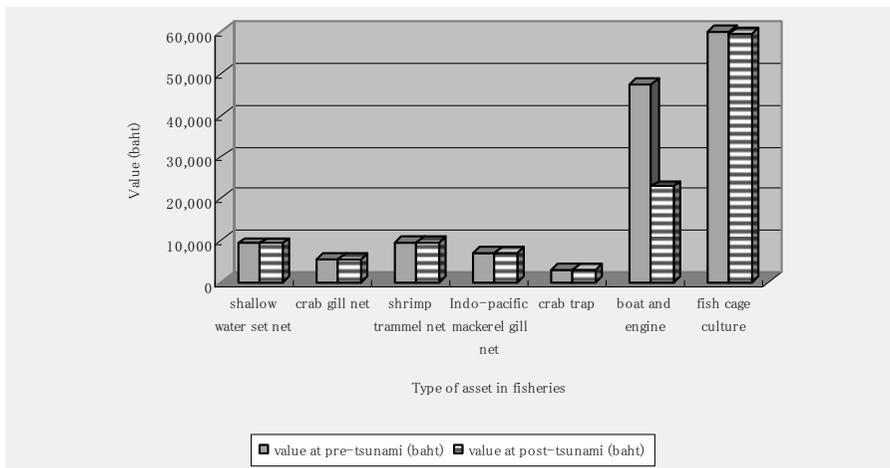


Fig. 4 A value of asset in fisheries sector on average at pre- and post-Tsunami

Source: Data collection and village survey conducted in Klongkian Sub-district, June, 2005

farmers faced to underemployment and unemployment in fishing operations. Moreover, they have ended with a deficient income and hazard of livelihoods. Fishers and Fish-farmers were busy for two-three months long after tsunami left. They had to inform the head of village and the Klongkian Ao.Bo.To. Council the concerns of their asset in fisheries lost. Meanwhile, they had to wait for a relief both in kind and cash to rebuild

their capacity in fishing operation. This threat puts fishers and fish-farmer placed coastal resource management activity on low priority.

5. Relief scheme and stakeholders to the rehabilitation of fishing community

1) The Department of Fisheries as major and leading relief agency

The Thai Royal government has authorized ministries concerned to put a relief and assistance policy and program formulation on high priority. Rehabilitated fisheries sector, the DOF is major government agency in charge to implement the national relief policy and program for fisheries sector restoration. This government agency formulated an immediate relief action plan for small-scale fisheries. The framework of this relief action plan was placed the putting people first as top priority of relief work. A responsible fisheries and sustainable coastal resource management is key approach to recovery fishing community and fisheries sector. These approaches are as precaution to provide fishers assistances in fisheries not exceeding those fishers' capacity in fishing in the previous days.

The DOF eagerly formulated an immediate relief action plan for small-scale fisheries as seen in table 3. The DOF categorized damaged fishers in two priorities. First priority is damaged fishers who have registered card of fishing boat and fishing gear license. This card is issued by the DOF [12]. Second priority is damaged fishers who have no either registered card of fishing boat or fishing gear license. These categories of priority are similarly used with fish-farmers engaged in coastal aquaculture.

Table 3 An immediate relief action plan for small-scale fisheries

Type of fisher	Priority	Fishing boat		Fishing gear	Fish cage
		Boat body	Engine		
Registered card holder*	1	Not more than 20,000 baht	Not more than 10,000 baht	Not more than 10,000 baht	Not more than 20,000 baht
Non-registered card holder	2	_____ 70% of the amounts formulated _____			
Eco-tourism boat	3	On-going consideration on damage assessment			

Remark: *registered card holder means fishers or fish-farmers made recording on type of their engagement and capacity such type of fishing gear, fishing boat length, number of fish cage and stocking aquatic species. The DOF handled a conduct of this record whole nation in November, 2003.

Shown by table 3, non-registered card holder will receive a financial assistance only 70% of amount provided to those registered card holders. The DOF was considering the provision of a financial aid to damaged villagers carried out eco-tourism boat. The DOF also implemented this relief action plan based on legitimacy of fisheries laws on controlling fishing gear operation. On practice of the laws, this government agency puts high demand on an increase of responsible fishing practice and effective economic incentives [13]. It induced especially shallow water set net fishers, who have no registered card permitted to operate the fishing gears, to engage in other type of fishing gear such gill nets. Implemented the relief action plan, the DOF carefully checked both registered card and fishing gear permitted card to shallow water set net fishers before delivered financial aid.

Finding of the community survey conducted in June, 2005, was supportive information to give a visual practice of the relief action plan. Fig. 5 indicates that the DOF is major governmental agency to assist fishers in recovery. Remunerators are amounted to 71 % of total sampled remunerators received financial assistance from the DOF. Other respondents, which are 14% of the total, do not remember well from whom they get the aid. Many of respondents are 9% of the total spent their owned savings for their capacity rehabilitation in fishing. Provincial office and charity organization supports the respondents, which are similarly amounted to 3% of the total.

The implication of the DOF delivered financial aids to the rehabilitation of fishing village can be seen in fig.6. This chart is the DOF passed financial assistance to damaged fishers in Klongkian Sub-district before June 2005. The chart basically consists of the bars of financial need and financial assistance on average, respectively. Fishers, who lost

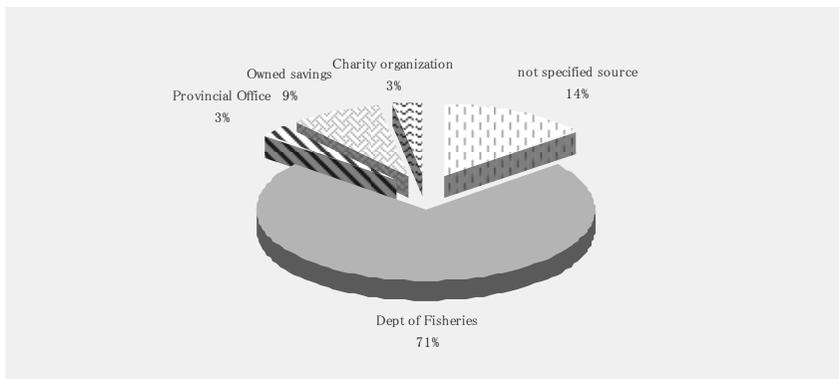


Fig. 5 Source of financial assistance appeared in Klongkian Sub-district

Source: Data collection and village survey conducted in June, 2005

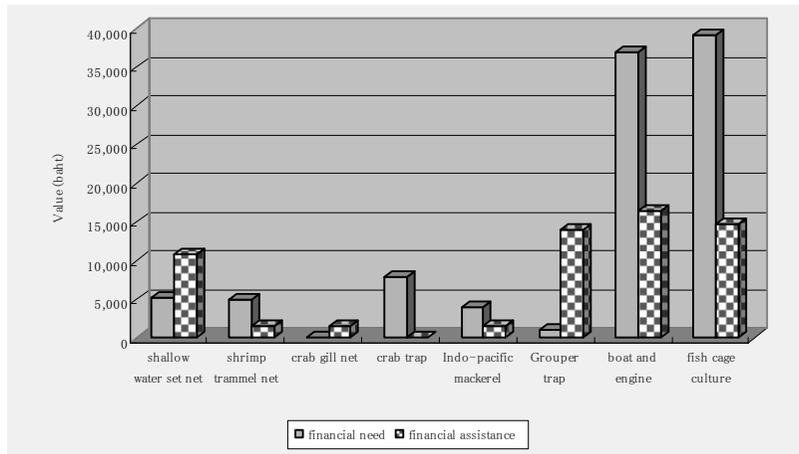


Fig. 6 The Department of Fisheries delivered financial assistance to fishers in Klongkian Sub-district before June, 2005

Source: Data collection and village survey conducted in June, 2005

shallow water set net and grouper trap, received financial assistance amounted to 10,750 baht and 13,960 baht, respectively. Fishers are paid 16,500 baht for repairing boat and engine. Similarly, fish-farmers obtain only 14,625 baht. To construct new fish cage and repair boat and engine, fishers and fish-farmers need amount of financial aid to 36,000 and 39,250 baht, respectively. However, some fisher likes crab trap fisher is not handed financial assistance as other damaged fisher.

The Department of Fisheries implements a delivery of financial assistance to damaged fishers into two primary activities as seen fig.7. Firstly, the DOF suggests the damaged fishers to establish fishers' group. This group manages the financial assistance as a revolving loan activity for investing in fisheries. Secondly, the DOF brings relief in kind such fishing gear, net, etc, to the damaged fishers. Each type of damaged fishers adopts a relief. Shallow water set net, shrimp trammel net and indo-pacific mackerel gill net fishers, which are numbered of 100%, 100% and 30%, respectively, run financial assistance as a revolving loan activity. Fish-farmers are suggested to manage financial aid as revolving loan. These are amounted to 73% of the aggregate fish-farmers bar. Other fish-farmers left 27% of the aggregate are handed a relief in kind. Crab trap and indo-pacific mackerel gill net fishers, which are 100% and 70% respectively, receive a relief in kind.

The DOF is major and leading government agency to immediately transfer a relief

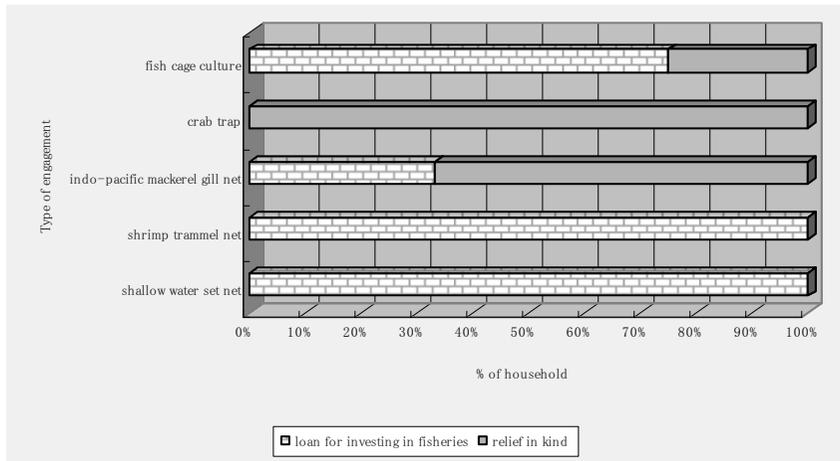


Fig. 7 An activity of financial assistance delivered to fishers with suggestion of the Department of Fisheries, Klongkian Sub-district

Source: Data collection and village survey conducted in November, 2005

to damaged fishers at first half of year 2005. This government agency applies fishers' participation into a relief program. This approach is implemented in Thailand longer than two decades. This approach is driving fishers to work in group. A transfer of financial assistance is supportive tool to gather fishers to practice a working in group on a revolving loan and allocation.

2) Substitute of assistance and management

The Department of Fisheries has a limitation to hand a relief down to damaged fishers. Its limitation means a deficiency of official in charge and budget. Both domestic and international non-governmental organizations eagerly help in relief. In Klongkian Sub-district, damaged fishers receive a relief from village fund group which originally found in the village (see fig. 8). They are assisted by domestic non-governmental organization such the Care (Raksthai) Foundation¹ and the Population and Community Development Association (PDA²). In addition, the DOF brings helps to fishers through the Collaborative project named "the Children of the Sea Project" funded by European Union. However, many of damaged fishers do not reach the relief. They have to spend their owned savings to buy new unit of fishing asset in capture and aquaculture.

The village fund group was established in 2001 with policy and action plan of the Ministry of Interior. Basic function of this group is to arrange revolving loan to villagers.

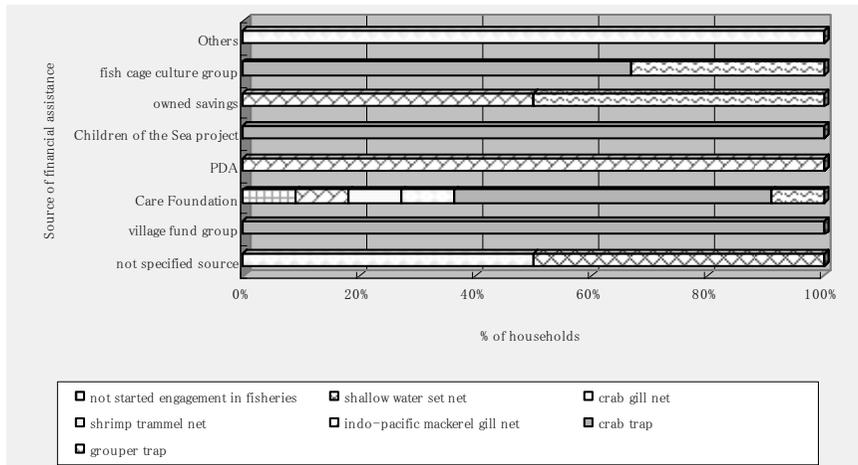


Fig. 8 Substitute source of assistance in Klongkian Sub-district

Source: Data collection and village survey in November, 2005

The group was lent by the Ministry amounted to one million baht. This amount of loan must be gradually repaid back to the Ministry within five years. This village group cannot provide much financial assistance to all fishers. It helps only crab trap fishers. The Care (Raksthai) Foundation is important substitute of assistance. This foundation largely helps all kinds of fishers such shallow water set net, crab gill net, shrimp trammel net, crab trap and grouper trap. The PDA mainly supports indo-pacific mackerel gill net. The help of “the Children of the Sea project” is strongly encouraged crab trap fishers. The objective of this project is to promote responsible fisheries by using big mesh size of crab trap’s bottom-side net.

The management of financial assistance is commonly formed a revolving loan activity. The Village fund group and the active non-governmental organization recommended damaged fishers to establish fishers’ group. Both former and newly established fishers’ groups similarly run financial aid as revolving loan management. The Care (Raksthai) Foundation support 79% of the aggregate fishers to newly form fishers’ group with a revolving loan management activity (see fig. 9). The PDA, the Children of the Sea project and the village fund group are alike. They contribute the fishers numbered of 7% of the aggregate to handle a revolving loan activity.

Various government agencies and non-governmental organizations deliver a ton of aids to damaged fishers after tsunami. The findings are illustrated in the charts affirmed a poor coordination between government agencies and non-governmental organizations

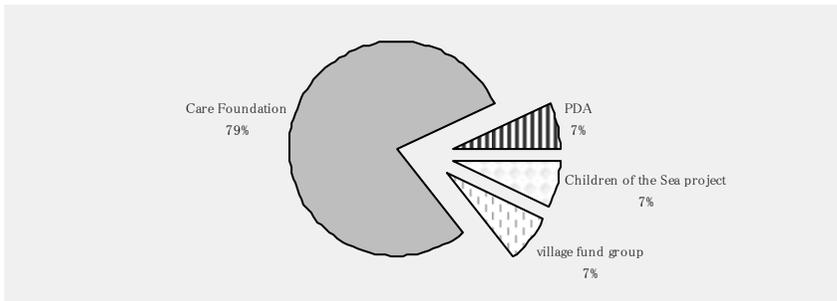


Fig. 9 A number of fishers runs a revolving loan for fisheries according to the substitute source of assistance, Klongkian Sub-district

Source: Data collection and village survey in November, 2005

[12]. Each agency and organization implements a relief on its own plan. It is focusing to work with people' group in community. This is to strongly develop the group's ability supporting sustainable management of coastal resources [14]. The government agency and non-governmental organization concerned similarly executes activity with the same pattern and practice. A damaged fisher may be least a member of two fishers' group. Many of newly established fishers' groups are found without link. This implication may need a facilitator of sub-group management. This is to make link of sub-group. The empowerment of the link is strengthening to community development and resource management.

3) A revivable fishing community

Fishers damaged in Tsunami have done self-help on recovery of their households. They sought for ruined fishing gear, fish cage culture compartments and materials. They helped each others to lift up fishing boat sunk down in the sea, etc. These fishers also quickly rebuild their capacity in fishing and aquaculture. This is to restart their way of lives and livelihoods in fisheries. They spent a financial assistance for three basic purposes. These purposes are for fishing operation, for carrying out aquaculture and for encouraging child's education. Fig.10 shows number of fisher paid financial aid for specific purpose. This chart indicates that 52% of total fishers expended a financial aid for restarting fishing. Second proportion of fishers are numbered of 24% of the total spent a financial assistance for their child's education. In addition, 17% of the total invested a financial aid for re-carrying out aquaculture.

Two fundamental types of fishers restart their livelihoods in fisheries. One is fishers

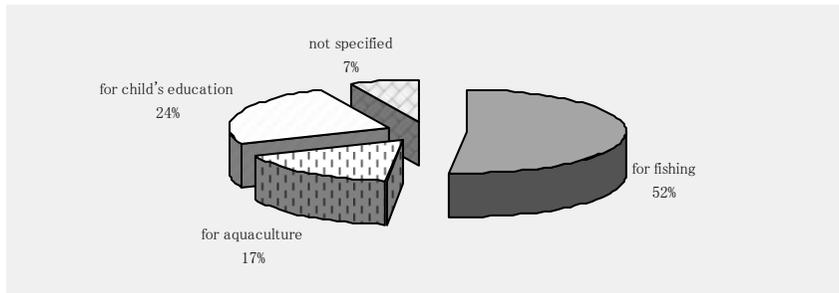


Fig. 10 A purpose of financial assistance expense, Klongkian Sub-district

Source: Data collection and village survey in November, 2005

engage in fishing only. The other is fishers employ in both fishing and aquaculture. This result implicates they engaged in the same employment as they are used. Fig.11 shows type of asset in fisheries primarily found at fishing household. This chart clarifies a combination of capture and aquaculture fisheries and capture only. Looking at shallow water set net bar, it consists of 65% of fishers used only the fishing gear, and 35% of fishers employed both the fishing gear and grouper cage culture. The bars of shrimp trammel net, crab trap, grouper trap have a similar result as the shallow water set net fishers. Crab gill net fishers operate this gear coupled with grouper cage culture.

Table 4 is a value of asset in fisheries on average. This table clearly expresses the scale of fishing household economy which considers based type and value of the asset. First is considering on value of fishing asset in capture fisheries only (second sub-

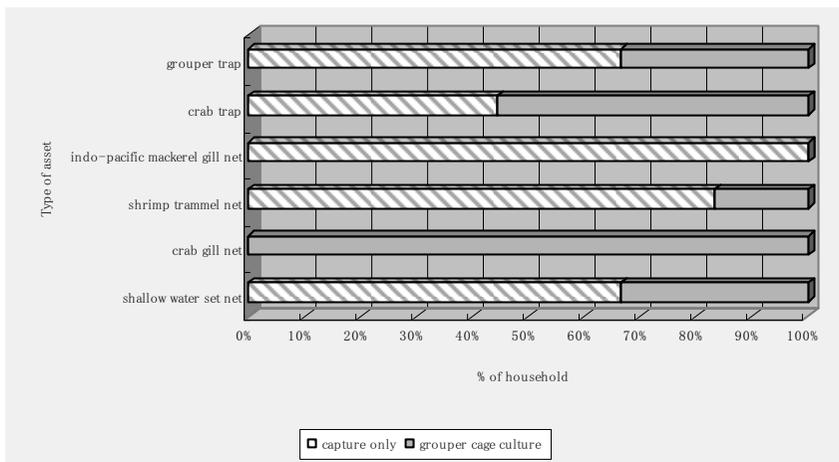


Fig. 11 Type of asset in capture and aquaculture fisheries, Klongkian Sub-district

Source: Data collection and village survey in November, 2005

Table 4 The average value of asset in capture and aquaculture fisheries, Klongkian Sub-district

Type of asset	Value (baht)		
	capture only	grouper cage culture	
	for fishing gear	for fishing gear	for aquaculture
shallow water set net	8,937	10,160	6,000
crab gill net	0	1,300	2,000
shrimp trammel net	7,230	400	4,000
indo-pacific mackerel gill net	1,500	0	0
crab trap	7,163	6,716	11,080
grouper trap	5,873	8,450	15,000

Source: Data collection and village survey in November, 2005

column). Fishers possess shallow water set amounted to 8,937 baht, and 7,230 baht of shrimp trammel net, 1,500 baht of indo-pacific mackerel, 7,163 baht of crab trap, and 5,873 baht of grouper trap. Looking at a combination of capture and aquaculture, value of the asset is categorized in two parts which are of fishing gear and aquaculture, respectively. A combination of shallow water set net and grouper cage culture has possessed 10,160 baht of the fishing gear and 6,000 baht of the fish cage culture. Fishers engage both shrimp trammel net and grouper cage culture possessed the fishing gear and fish cage amounted to 400 and 4,000 bahts, respectively.

The revival of fishers and fish-farmers is conventionally practiced in capture and aquaculture fisheries as previous days. Type of asset in fisheries, which is possessed by fishers at recent, is affirmative information. The revealing of the asset value is ensured that the scale of fishing household economy smaller than it was. Particular fish cage culture is both capacity and value become small. The asset value is also expressed that the delivery of financial assistance for rebuilding capacity in fisheries is not enough. This reduces a worrying of excessive number of fishing gear and fishing capacity.

6. Conclusion and discussion

1) A relief policy and sustainable coastal resource management

The Department of Fisheries (DOF) has main objective to place responsible fisheries towards the relief policy. It plans to control number of shallow water set net fishers

and the fishing gear unit. It emphasizes particular fishers who have no fishing license to operate shallow water set net. A poor coordination between the DOF and non-governmental organization is a sensible cause to the rebuilding of a new unit of shallow water set net belonged to non-license and license fishers. The DOF inspects carefully on the license. But the non-governmental organization offers both types of the fishing gear license holders.

In practicing an increase of responsible fishing gear, the DOF is major government agency to hand gill net fishing gear to fishers. Meantime, non-governmental organizations also support gill nets to fishers. Fishers conventionally restart their way of life in fishing to secure their livelihoods. They employ in the same type of fishing gear that they expertise. This implicates re-operation of traditional fishing gear such shrimp trammel net, crab gill net, grouper trap, crab trap and shallow water set net. The way of practicing these types of fishing gear is explicitly meant to fishers participated in responsible fisheries. This means of fishing operation is strongly supported to draw a sustainable coastal resource and management.

Seemingly, a fisher received a large number of gill nets. Actually, each type of gill net is such shrimp trammel net and crab gill net longer used only one to three months. In Klongkian Sub-district, shrimp trammel net fishers cite that they have to change new net of the fishing gear every forty-five days. The use of crab gill net fishing gear is alike as the shrimp trammel net. Grouper trap is easy to contribute a reconstruction. Grouper fishes, which are caught from wild in local coastal areas, are high demand to encourage re-carried out fish cage culture. However, grouper trap fishing operation is freely to catch target fishes without fish sized control.

Financial assistance granted by government agency and non-governmental organization is incentive strategy. This strategy is used to gather fishers to work in group. Fishers' group had oriented practice the strategy since previous time. The group and its members mainly exercise in financial management as village-based revolving loan. A little longer remaining of loan allocation activity is primarily supported to fishers to access a loan with low interest. Then, they continuously buy a set of traditional fishing gear.

2) An opportunity to strengthen Sub-district Administrative Organization

Generally, the Klongkian Sub-district administrative organization (Ao.Bo.To.) has legal status of being a juristic person [9]. The Ao.Bo.To. Council has legislative responsibility

to coordinate and lead rehabilitation activities. It has also been able to coordinate with local grass root organizations. In practice of recovery, the Council does not coordinate either the DOF or non-governmental organization to work in a relief program. The Council members are representative of each village initially helped in official recording number of fishers damaged. The DOF mainly checked damaged fishers from this official record. The Ao.Bo.To. Council can freely manage its owned budget for community development and welfare management. However, it has no extra amount of budget to support damaged fishers in rehabilitation.

Two causes are impediments to reduce an opportunity to develop the Ao.Bo.To.. One cause is as the World Bank mentioned that a relief program placed an emphasis on working with community groups. Other cause is the Council members work only a part-time basis. It generally meets only once a month. Full-time staffs of the Ao.Bo.To. are in charge to run office work. They have no authority in making decision. The Ao.Bo. To. is ignored its function and responsibility. In addition, it losses chance to develop its skill in particular financial management and allocation. The gap between the sub-district administrative organization and local people's group probably become wider.

Fishers' groups are as village-based management body. The group has capacity to manage the group's activity. The Sub-district Administrative Organization has officially function and responsibility to manage community resources on its territorial boundary. The linkage of across-sector, which is between fishers' group and the Sub-district Administrative Organization, is strongly requisite. The sub-district administrative organization should do legislative approval to safeguard its local resources from illegal and irresponsible fisheries. These types of fisheries may operate by local fishers or non-local fishers.

In addition, the Sub-district Administrative Organization should authorize its function and responsibility on resource manager basis. It is better to practice functioning in a reduction of mangrove deforestation and an increase of mangrove reforestation. Fishers' group and its member have made an agreement on using and managing mangrove forest management. The Sub-district Administrative Organization should adopt and approve the agreement as regulation. This is main legislative function of the Ao.Bo.To. contributed to coastal resource and environmental management. The effective legislative approval on the agreement is affirmed a well-practice of decentralization authority in coastal resource management.

Notices

- 1) See more information at www.raksthai.org
- 2) See more information at www.sli.unimelb.edu.au/pda/drmechai.htm

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Coastal Fisheries Management towards the Rehabilitation of Small-scale Fisheries: the Case of Phang-nga Bay, Thailand

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Abstract

The first objective of the study is to identify the loss and damage of fishers by tsunami devastation. The second objective is to clarify the outcome of relief programs, contributed to the rehabilitation of fishing community. The last objective is to view the implication of the relief programs facilitating fishers' participation in the development of local government body. In December, 2004, tsunami severely affected Phang-nga province. The big waves wrecked fishing assets such stationary fishing gears, fish cage and boats. The Department of Fisheries (DOF), Thailand, had the objective to emphasize the development of responsible fishing in the relief policy. In practicing an increase of responsible fishing gear, the DOF planned control the number of shallow water set nets. It provided gill net fishing gears to affected fishers. Fishing operation was strongly supported to draw a sustainable use of coastal resource and appropriate management.

Key words: tsunami devastation, relief program, fishers' participation, responsible fishing, sustainable use of coastal resource, management

零細漁業の復興に向けた沿岸域水産資源管理

－タイのパンガー湾の事例－

パタリヤ・スアンラタナチャイ
山尾政博
ワントナ・チェンキットコソン

要約

本論文は、2004年12月に発生したスマトラ沖地震・インド洋津波で被災したタイの漁村を対象にした事例研究とし、第1に漁業の被害状況を明らかにし、第2に漁村復興に向けた支援活動と利害関係者の活動を分析することである。第3に漁業者の復興活動への参加と自治体の発展に向けた彼らの貢献を促す支援活動の実施状況について明らかにすることである。事例研究が対象としたパンガー湾では、漁業生産手段が津波被害で大きな損害を受けた。タイ水産局は漁業復興を実施するにあたり、持続的な漁業（「責任ある漁業」）を実現することを目標として掲げた。漁具の許可・登録制を強化し、この地域で広く用いられている浅海定置（「ポー」と呼ばれる）の設置統数を制限した。被害を受けた漁民に刺し網を提供し、持続的な漁業活動への転換を促した。

キーワード：津波荒廃，支援プログラム，漁業者の参加，責任ある漁業，持続的沿岸資源利用，管理