



## Fishers Perception and Attitude Toward Local Knowledge and Local Practices and Its Role in the Fisheries Management: a Case Study in Mae Klong River, Samut Songkhram, Thailand

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### Abstract

An understanding of traditional local knowledge and practices is widely viewed as critical for the establishment of sustainable local fishery management. Locals' perceptions of governmental fishery regulations, the use of local knowledge and local practices in fishery management, and fishers' attitudes toward cooperation with the government are of particular interest.

The objectives of this research were to identify local knowledge and local practices in the fishing community in the vicinity of the Mae Klong River, Klong Kone Sub District, Samut Songkhram province, and to determine the fishers' perceptions about fisheries regulations and the use of local knowledge in fisheries management.

An Institutional Analytical Design Framework (IAD) approach was used to evaluate how a management institution should be designed, by combining participation from local knowledge and local practices and government or other concerned authorities. Two different types of methods were used for field data collection. The first was interview and discussions with key informants (120 fishers) and the second method was dialogue between formal and informal actors. (10 participants, representing each villages, government official and other related organizations in the vicinity of Mae Klong River, Klong Kone Sub district, Samut Songkhram province).

The study demonstrated that local knowledge and local practices by local community may affect traditional community-level agreements. An example could be taken from the case of local knowledge in the form of beliefs regarding the role of deities in protecting fishers from harm and the practice of securing blessings for better catches can be used to regulate the use of mangrove forests and other fishery resources. Local communities in Mae Klong River believe and respect the spirit of deities, in the form of The Goddess of River (locally known as "Phra Mae Kong Ka"), which is believed to be the protector of the waters resources and hence will punish the one who violate the River. Local knowledge, in the form of relation between spiritual and material which are still believed by local community, could be a basis for conservation. On the other hand local practices also applied by local community which some of the regulation had been assimilated with the government regulations. Mae Klong River Fishers believe that a combination of local and governmental regulation will increase the acceptance of fishing regulations and therefore be more suitable for local fishery management than government-imposed regulation.

Government's support in the form of legal framework is an important point, as well as that decision on the fishery management plan should be made by the community, not only by the central or provincial authority alone.

**Keywords:** Fishery managements, local communities, local knowledge and practice, fishers' perception, fishery co-management.

### Introduction

The concomitant pressure on the extracted resources has since caused a decline in fishery resources. Thailand's Department of Fisheries has recognised that marine capture fisheries require expansion into high-seas fisheries, although the potential use of high-seas resources has not been well examined. The tragedy of commons and the lack of effective enforcement has always been the key issue constraining the optimized use of natural resource.

Recently, it was recognized that the community-based resource management regime may in fact be an alternative, and could provide an answer to environmental degradation. Nevertheless successful community-based management arrangements rely on various factors. Strong local organization is but one of the criteria for success Tokrisna *et al.* (1997).

Anuchiracheeva (2004) listed the problems that were caused by this change in fishing policy: the failure to manage fishing resources, over-exploitation (particularly in marine fisheries), conflicts among

resource users, and the lack of fishers's rights to manage fishery resources. The latter problem results from the inability of fishers, who represent the primary fishery resource users, to become involved in the conservation of fishery resources, will eventually result in the depletion of fishery resources and the loss of income for fishers.

However, local community concerns on natural resource management has been increasing. Non-government organizations' involvement enhances such concerns. It must be noted that successful development of community-based management needs at least strong community organization, recognition on the sustainability of available resources, compliance and effective enforcement, as stated by Tokrisna *et. al* (1997).

In many Asian countries, fishery policies and regulations have been designed using a top-down approach. The government plays the role of rule maker and is the dominant player in the management of marine resources. Fishers have been excluded from participating in the formulation of regulations. The collaboration by fishers is limited, since fisheries resources are treated as common property, they do not belong to anyone. The fishers are unwilling to give collaboration to the government for the fishery management program. They just want to catch as much as possible each day because they believe that if they follow the fishery management program they will be losers. This makes the fishery management program of the government faced difficulties in implementation.

This approach leaves fishers no incentive to follow the rules, as examined by Abdullah and Kuperan (1997). Thus, Nielsen *et. al.* (2004) opted the conventional combination of a top-down approach with a narrow focus on resource issues fails to address the core concerns of fishing communities. It is considered insensitive to local conditions, due to lacks of support from the fishing communities, and it is inefficient in achieving its objectives.

On a practical level, because certain government regulations adapt to and accommodate community needs less effectively, the regulations are not well accepted and therefore ineffective. This outcome could be a result of the government's considering local knowledge unimportant to fisheries management, since traditional knowledge has been regarded as primitive, unsustainable and non-existent by Ruddle and Satria (2010).

As the interests and concerns of fisheries experts in South East Asian countries recognized that fishery cannot be managed effectively without cooperation of fishers to make laws and regulations works. It might be some countries in Asia still using top-down approach, since to change the perspective in one night wouldn't be easy, but generally the concern of decentralization, co-management and community-based management has been increased. The realization of the need to increase participation by

resource users in fisheries management and greater localized control over-access to the resource can be seen throughout the Southeast Asia regions (Pomeroy, 1995).

Among the member countries of the Association of Southeast Asian Nations (ASEAN), the policy of rights-based fishery management and co-management between the government and the local fishing community is considered an innovative approach to coastal fisheries management as stated by SEAFDEC (2002). This approach includes participation by the local fishing community. Knowledge and practices of local people of local fishermen can be extracted as the participation of local communities and should be strengthened and built up to be incorporated into fisheries management.

Local knowledge that has been built from traditions should be regarded as building blocks for increasing the effective co-management of small-scale fisheries. Traditional systems can also serve as an entry into community engagement and produce an increased sense of stewardship and belonging in the local community. Local knowledge here means unwritten lore of culture, or pass on by word of mouths. For centuries, local knowledge has gain popular term as one of the tools in natural resources management. This includes the involvement of local community as stakeholder in the management process, and the importance of working together with the local community in order to achieve the mutual purposes. As for the definition of local practices for this study carry the meaning of a habitual or customary action or act, to do or perform habitually or customarily; make a habit of. This research tried to find out whether incorporating local knowledge and/or practices in government regulation will be able to help to solve the problem of fisheries resources.

The objectives of the research were to identify local knowledge and local practices in the fishing community in the vicinity of the Klong Kone Sub District, Mae Klong River, Samut Songkhram Province, and to determine the fishers' perceptions about fisheries regulations and the use of local knowledge in fisheries management.

## Materials and Methods

### Study Area

SamutSongkhram province is a province in the Central plain of Thailand located in the south-west coastal area near the gulf of Thailand. It is about approximately 72 kilometres from Bangkok. Total area is about 416.707 square kilometres. SamutSongkhram consists of 3 districts: Muang, Amphawa and Bang Kon Tee. Samut Songkram Province are famous for its cultural attributes. Mainly in the Muang Mae Klong, they have strong faith in Buddhism (Siripoon, (2004) in Suravanichakit (2009)).

### Field Data Collection Methods

Two different types of methods were used for field data collection. The first was interview and discussions with key informants (120 fishers) and the second method was dialogue between formal and informal actors. (10 participants, representing each villages, government official and other related organizations in the vicinity of Mae Klong River, Klong Kone Sub district, Samut Songkhram).

An Institutional Analytical Design Framework (IAD) approach was used to evaluate how a management institution should be designed, by combining participation from local community knowledge and government or other concerned authorities. The Institutional Analysis and Development (IAD) framework (developed by Ostrom *et al.* 1994) is a multidisciplinary tool to analyze public policy and governance over resource use in formal and informal institutional contexts (Imperial, 1999). The IAD framework works by identifying an 'action situation' which is created by the physical attributes of the resource base, the attributes of the community and/or actors and the rules-in-use. The action situation defines the interaction among different formal actors (e.g., government officials and formal organizations) and informal actors (e.g., local resource user community, community leaders, and informal organizations). The framework allows researchers to evaluate the interactions among actors based on evaluation criteria.

These interactions form the basis of rules for decision-making (Ostrom, 1986).

The researchers interviewed fishers and stakeholders who lived in the vicinity of Mae Klong River, Samut Songkhram (Figure 1) with assistance of Thai interpreter.

The first method of primary data collection was conducted by personal communication with head of village in the area and elderly fishers, who gave information about the head of fishers' name who will be the key informants, before continue to interview the other fishers member (snowball sampling) (Foster and Vincent, 2010). Interview and discussion included informal interview with key informants (120 fishers), varies from head of local fishers, individual fishers (representatives of each villages), officer of Department of Fisheries (Central and Provincial), and private institution in the area which is related to the field of fisheries. The second method of primary data collection was conducting dialogue between formal and informal actors (10 participants, representing each village, government official and other related organizations in the vicinity of Klong Kone Sub district, Mae Klong River, Samut Songkhram). During the interviews, participant held a discussion guided by the interviewer based on a predetermined list of questions, but the direction and scope of the interview were allowed to follow the participant's way of thought. The purpose is together information that came up in the conversation. Secondary data were collected from government agencies, research centres,

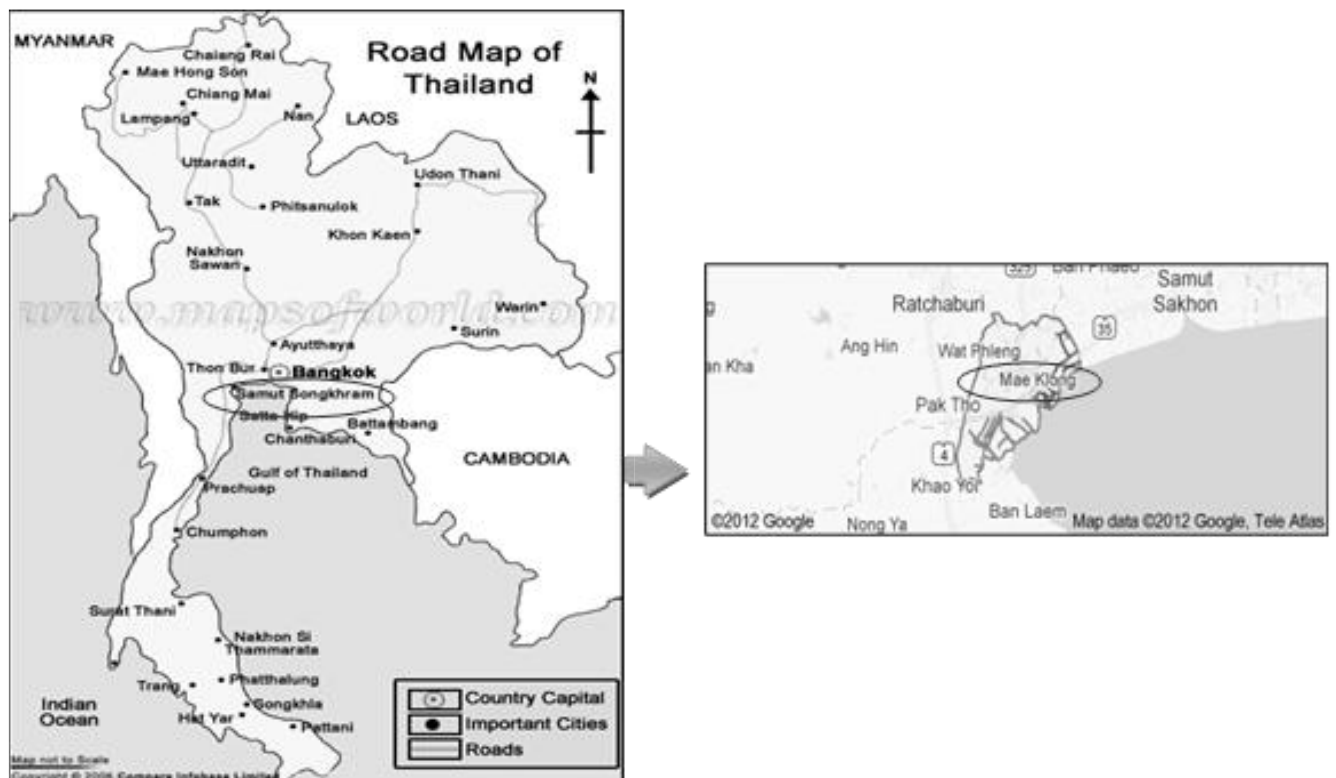


Figure 1. Research location on the Mae Klong River, Samut Songkhram.

and academic institutions.

### Respondents

According to Yamane (1967) in Bhujel (2008), the formula for determine the sample size for survey research are as follows:

$$(n) = N / (1 + N \times (e)^2)$$

Where:  $n$  = sample size,  $N$  = total population,  $e$  = probability of committing Type II error or b (normally 10%)

The population of fishers in Klong Kone Sub District are 1176 persons, therefore:

$$(n) = 1176 / (1 + 1176 \times (0.102)^2) = 88.86$$

With consideration that some data might be missing or some fishers did not respond, the sample size was added 50% than the estimation result from the formula, therefore, sample size become approximately 136 fishers. Total of 120 questionnaires were answered properly.

The interview was conducted by distributing questionnaires that included questions grouped into 5 categories: (1) the primary problems related to fisheries and aquatic resources in the area and the efforts to solve them; (2) traditional beliefs, such as relationships with Phra Mae Kong Ka (the Goddess of the River), and the function of traditional beliefs that are related to fishing management; (3) local practices and the participation of fishers in such practices; (4) government regulations; (5) co-management.

The respondents filled out questionnaire attended by the researchers and interpreter, to maintain communication to provide further explanation of some questions that might not clear for the respondents.

During the dialogue process, participants hold a discussion in the form of role play, representing each of the stakeholders involved in the area. Dialogue is guided by the interviewer is based on several lists of topics, but the direction and scope of the dialogue allowed for the participants to follow the way of thinking about the problems related to fisheries management and how to solve problems with their respective roles.

### Results

In rural Thailand, rivers run through every facet of its history, economy, and daily life. Furthermore, the Thai people harmonize their lives to correspond with the rhythms of the river by designing towns and villages, houses, boats, occupations, and lifestyles according to the river's moods and seasons (Van Beek, 2004). One of the main factors that may affect the

level of affinity of the local residents to the Mae Klong River is the relative distance of their place of residence and work stations. In this study, the majority of the respondents work in various places located near or adjacent to the River.

As of 2013, the total population of Mae Klong River, KlongKone sub district are 4347 persons, and the number of villagers who has occupation as fishers are 1176 persons, the highest among other occupations in the sub district.

KlongKone Sub district consists of 7 villages: Ban KlongKod, Ban KlongKone, Ban KlongKlone, Ban Praek Ta Le, Ban Klong Chong, Ban PrachaChomchuen and Ban Klong Chong Noi. Total area of KlongKone Sub district is 39.30 square km. Most areas are coastal, wetlands, and mangrove forest, therefore main occupation of the community is in the fishery sector.

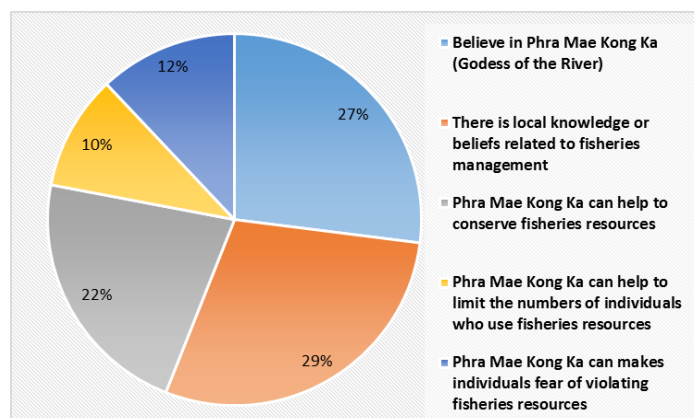
### Local Knowledge and Practices in the Fishing Community and Pre-existing Management Practices in the Vicinity of the Mae Klong River, Samut Songkhram

Certain local knowledge and practices in the vicinity of the Mae Klong River, SamutSongkhram, are expressed in the form of belief in a deity. The primary function of this belief is to elicit protection from harm during fishing and an abundant catch.

Local knowledge in the form of spiritual beliefs exist in the fishing community (Figure 2). Local community people believe that a deity can determine the size and quality of their catch. In another example, individuals in the fishing community are careful not to make the deity or unhappy by damaging fishery resources to avoid incurring bad luck. Fisheries resources can be damaged using destructive fishing equipment and polluting the water.

Approximately 27% of the respondents confirmed their belief in Phra Mae Kong Ka, (The Goddess of the River) and 29% stated that there are relationships between Phra Mae Kong Ka and the conservation of fishery resources. Ten per cent of the respondents stated that these beliefs limit their activities, 22% tended to be more careful in using aquatic resources as a result, and 12% stated that the traditional belief in a certain deity can make individuals fear violating fishery resources.

Respondents stated that the belief in the relationship between Phra Mae Kong Ka and fishery resources will compel greater care in the use of aquatic resources (40%) or instil a fear of violating fishery resources (30%). The way in which the local community treats aquatic resources is most likely influenced by traditional beliefs and fears that something unpleasant might occur if the provisions of certain gods that are associated with the resources are violated.



**Figure 2.** Functions of local knowledge in Mae Klong River, Samut Songkhram.

**Table 1.** Local practices

No.	Local practices	Function
1	Prohibition on placing fish nets in the canal	Avoid disturbance of boat traffic in the local community's waters.
2	Prohibition on running fishing boats at high speeds in the canal that runs through the village	Safety.
3	Monitoring the intrusion of any commercial fishing vessels in the artisanal fishing area (within 3 km of shore)	Prevent commercial fishing vessels from entering the artisanal fishing area.
4	Prohibition on using any destructive fishing gear	Avoid destruction of fisheries resources.
5	Prohibition on extracting mangrove trees from the reserved area (excluding those planted by local individuals in their own area for non-commercial purposes)	Mangrove protection.
6	Cooperation between the local community and officials of the mangrove protection stations to promote mangrove planting in reserved areas (local individuals are allowed to collect and sell mangrove seedlings)	To ensure the sustainability of mangrove tree resources.

### Local Practices in the Vicinity of the Mae Klong River, Samut Songkhram

There are no formal rules that allow or prohibit fishing activities in the area. However, individuals from the local community have reached agreements that are intended to prevent conflicts among the fishers (Table 1).

Local practice in the area were made based on an informal agreement between the local community, primarily to protect the waters and resources where their livelihood. Local residents have understood these regulations although the rule is only in the form of oral and not written and there is no formal legal force governing penalties for violators of the rule.

For avoiding non-resident to trespass the waters of Mae Klong River, local practices include awarding fishers from the local community the right to issue fishing regulations in their area and to monitor the compliance of non-resident fishers with these regulations. In addition, if a conflict occurs between local and non-resident fishers, the fishers typically solve the conflict at an internal meeting rather than involving the government.

Specifically, in Thailand, the problems of over-

exploitation of fisheries resources include deteriorating of social-economic conditions of fishing communities, increasing conflicts between commercial and small scale fisheries, over capitalization in fishing capabilities resulting in significant economic waste, environmental and resources degradation (Karnjanakeson and Yen-Eng, 1996).

However, in the local community, local knowledge and practices are limited to verbal agreements. There are not written or other legally binding forms of these agreements. Additionally, the government of Samut Songkhram does not acknowledge local knowledge and practices specifically. This view differs from the village-based fishery resources management of Vanuatu, in which the government supports self-management by the villagers (Johannes 1998). Traditional management in Laos, in a particular province had been identified and modified for the present time condition, in the form of areas seasonally or permanently closed, gear limitations and protection of species, fish sanctuary, and small wetlands management (Ruddle and Satria, 2010).

### Local Perceptions Regarding Government Fishery Management and the Use of Local Knowledge in Fishery Management

The provincial fishery officer has invited the local community to write a set of rules based on government regulations, but however, this approach failed because the fishers claimed that the community agreement was sufficient. The fishers fear that new regulations would make fishing more difficult. There are also local opinions that government regulations would be difficult to obey and would not be based on the actual status of community resources.

The government could not use all of the local community fishing agreements because the government considers local regulations, unlike central regulations, to be unsuitable for other areas. In principle, government regulations should apply equally to every fishers in all areas. The government used regulations that were based on the Thai Fishery Law of 1947 as a central regulation on the Mae Klong River. However, government officials also aware of the existence of the local community's informal agreement.

The fishers realise that they can present their ideas and criteria when rules are written and that these ideas can be discussed with government officials. Additionally, they are aware that providing this input is an alternative to being uncomfortable with regulations that are created by the government alone. According to the fishers, the government has attempted to enforce regulations without taking the local regulations into consideration.

Local regulations can reinforce government regulations because they have more influence on the local community that is the target of the regulations. Additionally, Regional Fisheries Livelihoods Programme for South and Southeast Asia (RFLP) (2013a) stated that combining local with government

regulations is important to enforcing compliance. According to the respondents, fishers participation is important because (1) local regulations are more likely to be accepted by the local community (45%), (2) fishers better understand fisheries resources (40%), (3) government regulations that are established without involvement of the local community are ineffective (12.5%), and (4) most fishers do not obey government regulations (2.5%). (Table 2). Fishers participation in fisheries management can provide a wealth of local or indigenous knowledge to supplement scientific information, to help monitor the resources, and to improve overall management. The delegations of fisheries management and allocation of decision to the local level may be more effective than the management efforts which distant, under-staffed and under-funded national government fisheries agencies can provide, according to Pomeroy (1995).

### Fisher Attitudes toward Cooperation with the Government

The respondents believed that the combination of local and government regulations would help solve resource problems because (1) the government would be involving the local community in identifying problems (27.5%) and (2) government involvement would reduce noncompliance by fishers (25%). Involving the local community in decision making would increase the sense of belonging, stewardship of the regulations, and compliance (Table 3).

Government recognition of the practices of the local community might help improve local knowledge because legal acknowledgement by the government would strengthen such knowledge and practices. Local community's involvement by the government in identifying the problems in the area might increase the effectivity and efficiency in fisheries management, since the local community are the one who understand

**Table 2.** Reasons for fishers' participation

No.	Response	No. of respondents (persons)	Percentage (%)
1.	Fishers better understand fishery resources	48	40.0
2.	Government regulations that are established without local input are ineffective	15	12.5
3.	Most fishers do not obey government regulations	3	2.50
4.	Local regulations are more likely to be accepted by the local community	54	45.0

**Table 3.** Reasons for the effectiveness of a combination of local and government regulations in solving local fishery resource problems

No.	Response	No. of respondents (persons)	Percentage (%)
1	The government involves the local community in identifying problems	33	27.5
2	Government involvement will reduce noncompliance	30	25.0
3.	No answer	57	47.5

their own area and most probably would support the government with the informations of recent problems occurred. Eventually this involvement will helps reduce non-compliance from the local community.

In the Ha Lien area of Vietnam, the government officially recognised the authority of a local community group to protect the area from fishing using destructive electric fishing equipment (Nasuchon and Charles, 2010).

### **Institutional Analysis and the Fisheries Management**

#### **The Action Arena and Action Situation**

The action arena is the fishery sector, particularly in fisheries management in Klong Kone Sub District, Mae Klong River, Samut Songkhram. The action situation defines the interaction among different formal actors (e.g., government officials and formal organizations) and informal actors (e.g., local resource user community, community leaders, and informal organizations)

#### **The Actors**

##### *Informal Actors*

- Resources users (fishers): represent direct users of fisheries resources
- Local informal authority (local leader): represent the customary legal system. Their responsibility mostly is to solve inter or intra-community conflicts among fishers or other local community

##### *Formal Actors*

- Provincial Government officials (Department of Fishery, Samuth Songkhram Province): formal institutional that are responsible for formulating policy related to fisheries management and actively involve with local community
- Central Government officials (Department of Fisheries): the highest formal institutional for formulating policy related to fisheries management
- Klong Kone Mangrove Forest Conservation Center (Table 4).

#### **Interaction Among Actors**

An analysis of the political interactions between informal and formal actors is central to explaining government attitudes (Agrawal, 2001). From the study it shows that direct communication between informal and formal actors does not really exist often, only in some specific issues. However, the Government as the formal institutions do not tend to think of other local institutions (local community's informal agreement) as a form of intervention to formal institutions.

#### **Characteristics of Rule**

Rules indicate the actions which are allowed to be performed and which are not. In addition, the violation of rules results in the authorization of sanctions (Ostrom *et al.*, 1994). Rules may come from both formal and informal institutions. However, the formal institution does recognize the informal laws and informal institutions also understand and aware of the existence of regulation from formal actor. Table 5 shows the comparison of regulations from both actors, in the form of informal agreement from informal actor and regulation from formal actor. Both sides understand the existence of each regulation and does not oppose or impose one form of regulation to another. Informal actor suggest to formal actor to involve their local regulation to the government regulation.

The process of formulating and incorporation of local regulation (informal agreement) are not easy and time consuming, and informal actor accept the acknowledgement from formal actor but request to take part in some of new regulation, in the form of consultation. This was requested with the consideration to increase the compliance to the regulation and to make sure the new regulation is suitable for local community as informal actor.

#### **Discussion**

This study demonstrates different perceptions among stakeholders about local knowledge and local practices, and their opinions about government regulation with and without involving local community. Government regulations have legal authority and are based on written regulations. However, local knowledge exists only as an informal, unwritten agreement among the members of the local community and lacks legal authority. As for local practices, some of them have been assimilated with government regulations (as seen in Table 1). Local community members are more likely to comply with local knowledge and practices than with government regulations alone because government regulations are not always suited to the realities of the local fishery resources. Additionally, government regulations do not always reflect the views of the local community because it was not involved in formulating the regulations. Recently some countries, namely Nepal and Zimbabwe has been provided local communities with a decision making power in the protected areas, which both are quite success (Negi and Nautiya, 2009). Another example can be seen in Indonesia, as 'sasilaut' in Maluku province, is one example for pre-existing fisheries management or local knowledge, in the form of marine tenure. It was emerged in response as a failure of centralized marine resource management (Ruddle and Satria, 2010).

Local knowledge and practices are supported by

**Table 4.** Result of discussion between formal and informal actors

Topics of The Discussion	Formal Actors	Informal Actors
Main Problem in The Area	Conflict between artisanal fishers and commercial fishers regarding to intrusion of commercial fishing vessel from outside the coastal zone (extend 3 km off-shore)	Depletion of fishery resources, mangrove degradation and fishers from outside the area
Local knowledge and practices in the fishing community and pre-existing management practices	<ul style="list-style-type: none"> <li>• There are no formally documented local regulations and that the only enforced fishery law is the regulation on fishing that falls under the Thai Fishery Act of 1947</li> <li>• The government aware of such local knowledge and practices (informally) but does not formally acknowledge local knowledge and practices specifically, because the base of the regulation is Thai Fisheries Act 1947 that covered all provinces, not only particular province</li> <li>• Confirmed that Provincial Fisheries Official and local leaders had been involved in previous dialogue at various time and actively involved in the local community</li> <li>• The government could not use all of the local community fishing agreements because the government considers local regulations to be unsuitable for other areas. The government regulations should apply equally to every fishers in all areas.</li> <li>• However, Provincial Fisheries officials are aware of the existence of the local community's informal agreement</li> </ul>	<ul style="list-style-type: none"> <li>• Individual in the local community believe that a deity can determine the amount and quality of the catches. Therefore, individual in the fishing community are careful enough not to make deity unhappy by not damaging fishery resources to avoid some unfortunate</li> <li>• Local knowledge and practices are limited to verbal agreements and still no written or other legally binding forms of these agreements</li> <li>• There are no formal regulations that allow or prohibit fishing activities in the area. However, the members of local community have reached agreements that are intended to prevent conflicts among the fishers</li> <li>• Fishers of local community mostly tried to solve the problem occurs by their own</li> <li>• To prevent non-resident fishers to trespass the waters of Mae Klong River, fishers from local community through local practices, issues fishing regulations in their area to monitor the compliance of non-resident fishers with these regulations</li> <li>• If conflict occurs between local and non-resident fishers, the fishers typically solve the conflict at an internal meeting rather than involving the government. Unless for some complex issue, then local community will seek further aid from Provincial of Fisheries official</li> </ul>
Local Perception regarding government regulations in fishery management and the use of local knowledge in fishery management	<ul style="list-style-type: none"> <li>• The government has tried to encourage local fishers to recommend specific regulations, by inviting local community leader to suggest a set of regulations to be incorporated in to government regulations. This effort was failed because fishers claimed that the community agreement was sufficient, and fishers fear that new regulations would make fishing activity more difficult to the fishers</li> <li>• In the other hand, government claimed that they have been introduced local fishing regulations into law but has not succeeded</li> </ul>	<ul style="list-style-type: none"> <li>• Common local opinion is that government regulations would be difficult to obey and would not be based on the actual status of the community resources</li> <li>• Fishers confirmed the government recognition of local practices, and that the government permits the local community to implement its own local regulation and practices</li> </ul>
Local practices in the vicinity of the Mae Klong River, SamutSongkhram	<ul style="list-style-type: none"> <li>• Confirmed that local community tried to solve their own problems, with the assistance of Provincial Fisheries Official for some complex issues</li> </ul>	<ul style="list-style-type: none"> <li>• For prevent non-resident fishers to trespass the water of Mae Klong River, local community formed their own patrol to monitor the waters environment and the compliance of non-resident fishers and put local sanctions according to their own local regulations: in the form of fined or such</li> <li>• If conflict occurs between local and non-resident fishers, the local fishers will tried to solve it by themselves in an internal meeting, rather than directly involving the government</li> </ul>
Fishers' attitude toward cooperation with the government	<ul style="list-style-type: none"> <li>• Change and formulate new regulations are not an easy task and time consuming since in Thailand formulating regulations can take several steps / processes</li> <li>• The Fisheries Officials could not promised, but they will put the fishers' opinion as a source for formulating some regulations</li> </ul>	<ul style="list-style-type: none"> <li>• Government recognition of the practices of the local community might help to improve local knowledge because government's acknowledgement would strengthen such knowledge and practices</li> <li>• Fishers believe that combined regulations could solve resource problems because the local community would provide expertise regarding the formulation of regulations and the government's involvement would reduce non-compliance</li> </ul>



**Table 5.** IAD Analysis of Fisheries Management by Local and Government Regulation

IAD Domain	Local community agreement	Government regulation
Physical World	Waters of KlongKone Sub District, SamutSongkhram and the environment around	
Community	Local community related to fisheries sector	
Rule-In-Use	Local community has local agreement	Regulations came from Central Government
	Local agreement doesn't have formal status since it was not written	Regulations from government has formal status and legally binding in written form
	Local community has a hope for the government to involve them in policy making	Government (Provincial Government) aware of the existence of local community's agreement but does not acknowledge it
	Local community believe that local community agreement will be better accepted by fishers	Regulations from Government already has a power and legally binding, apart from fishers' acceptance and compliance
	Local community suggest government to involve some of the local agreement in to government regulation	Government stated that it is not easy and take long time and process to change / make new regulations. But they will record and noted the local community's aspiration

the fisher's belief that local regulations would be better accepted by the local community because they come from the fishers themselves, who better understand the conditions and problems of the local fishery resources. Certain customary fishing regulations are spiritual and often obeyed because of fear of spiritual retribution.

The involvement of the community in the form of an informal agreement among themselves does not mean they demand an equal position with formal government regulation. The government makes regulatory decisions, but for the incorporation of the ideas, suggestions, feedback and opinions of the local community would ensure that the regulations reflect local problems. As a comparison in another country, Vietnam for instance, a long tradition known as 'van chai', a comprehensive institution structured to address the basic issues of community and aquatic resource management, focusing in the spiritual activities of fishing activities and managing floating villages in different groups. Another example can be seen in Malaysia, where The Locally Based Coastal Resource Management in Langkawi Project, works hand in hand with local community, who participating in the determination of zoning decisions and in the Fisheries Resource Management Plan. Moreover, local community has formed The Local Enforcement Unit (LEU) that conduct patrol activity in the rotation basis with The Malaysia Enforcement Agency (MEA) (Nasuchon and Charles, 2010).

Although it is unwritten, local knowledge is believed and trusted by the local community as a means to solve local problems. Anyhow, the local community's informal agreement does not fundamentally oppose government regulations. It simply requires such regulations to be compatible with local needs. The belief that a goddess will punish

them (the fishers) if they overexploit local resources reflects a conscious or subconscious understanding that their fishing practices can be destructive and unsustainable, and they are aware that overexploitation would affect their livelihoods.

The results of this study indicate that the local knowledge and local practices for managing fisheries resources in the Mae Klong River community have emerged spontaneously over time. They are a blend of local religious beliefs and outside influences, such as intervention from fisheries officials and other government officials. Although beliefs in deities remain prevalent, local practices are followed not only because of a fear of violating the interests of a goddess but also because of the influence of modern fisheries and resources management approaches. The respondent's feedback indicates that local fishing communities are eager to be involved in developing and strengthening management practices that ensure resource sustainability. They want to see their knowledge and practices are recognised in the development and formulation of local fisheries rules and regulations.

Local fishery authorities could build on such beliefs and the expressed interests of local fishers when establishing practices that ensure and sustain the livelihoods of fishers. These interests and existing practices are a starting point for relevant government agencies seeking to begin a dialogue with fishers that would result in further development of local fisheries rules and regulations.

Support from government in the form of legal framework is an important point to achieve success, as well as non-government organization who can help to strengthened community organization. The decision on the fishery management plan should be made by the community, not only by the central or

provincial authority alone. The participation of the government can be in the form of support (investing and providing for an adequate level, acting as a consultant on management development and supply adequate information on the management plan, etc.) and act as a partner or senior partner instead of being the sole decision maker.

Local fishery authorities could build on such beliefs and the expressed interests of local fishers when establishing practices that ensure and sustain the livelihoods of fishers. These interests and existing practices are a starting point for relevant government agencies seeking to begin a dialogue with fishers that would result in further development of local fisheries rules and regulations.

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