The economic impact of IUU-fishing and its countermeasures on small scale fishermen in Thailand: A case study of Baan Khan Kradai

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Abstract

This article investigates the economic effects of Illegal, Unreported and Unregulated fishing (IUU-fishing) on households of small scale fishermen, whose income derives almost entirely from fishing. The main question is “What are the economic impacts of IUU-fishing and government’s countermeasures on Thai fishing communities, in particular small scale fishermen’s households, before and after 2015?”. A mixed quantitative and qualitative approach was chosen to better grasp the complexity of fishing-related changes to household income, by looking into the case study of a small scale fishing community in Ao Noi Subdistrict of Prachuap Kiri Khan Province. The main results show the since the enforcement of the new regulation in 2014/2015, the fishermen have felt some improvement through the regrowth of fish stock and the enforcement of stricter regulation for commercial vessels. The income situation has, after initial gains, seen some losses in 2016, mainly due to higher costs or investments. The results provide data for future research on the economic situation of small scale fishermen. This approach might be useful as a template to be applied to other small scale fishing communities in Thailand or elsewhere. The limitations of this work are given by the sample size and the selected target community.

Keywords: IUU, fishery, economic situation, Gulf of Thailand, small scale fishermen
1. Introduction

The existence of IUU-fishing is a mix of mostly greed, unawareness of the impacts, lack of regulations or the lack of enforcements of the latter. As there might be no or not full taxes or duties on these catches being paid, it would give an unfair advantage to those who are not involved in IUU-activities. Instead the perpetrators violate the regulations on local, national and international levels, on the costs of nature, future generations and other properly operating fishermen and fishery businesses who face higher costs and lower catches due to their compliance to the law.

“By definition, IUU fishing is either an expressly illegal activity or, at a minimum, an activity undertaken with little regard for applicable standards. IUU fishers gain an unjust advantage over legitimate fishers; i.e. those who operate in accordance with those standards.” (UN FAO, 2001) It is happening nearly everywhere in the world where capture fisheries are active. The FAO mentions as an example of a legal basis of how to identify IUU fishing the EC Regulation No. 178/2002. (UN FAO, 2014) The issue is strongly related the Sustainable Development Goals (SDGs), especially to the goal number 14 “Conserve and sustainably use the oceans, seas and marine resources for sustainable development” – section 14.4 “to end IUU-fishing until 2020.” (UN General Assembly, 2015)

Some of the most affected and most vulnerable groups in the fisheries are the small scale local fishermen, as they have least means, financially and technology-wise to combat the unfair advantage taken against them. Especially the limited range and size of their vessels makes it impossible to compensate the loss caused by IUU-fishing in their close range. Often also their food supply to their families is threatened and not only their disposable income. This leaves them no other option but turn for example to
piracy or other illicit activities, as seen in some coastal regions of Africa and Asia already, which causes damage to humans, countries and international trade. That is the reason why this topic and thus this paper by analyzing reasons is of such importance.

This article is mainly based on and citing out of the related thesis by the author awaiting publication (Zwoelfer R., 2018) and is focusing on the economic aspects impacting the local fishing communities, more specifically on small scale fishermen and their families caused by Illegal, Unreported and Unregulated (IUU) fishing and the effects of the countermeasures by the Thai government to combat IUU-fishing in Thailand.

The government has stepped up its measures to reduce IUU-fishing. A while ago a set of governmental measures were newly introduced like e.g. the Command Center for Tackling IUU (CCTI) Commander with full control over all relevant governmental agencies, the introduction of the Thai Marine Fishery Management Plan (FMP) (Ministry of Agriculture and Cooperatives of Thailand, DOF, & IOTC UN FAO, 2015) coming along with a large reduction of the number of active fishing vessels. In addition a new licensing policy, establishing of sanctuary zones and the ban on some fishing gears as defined in The Royal Ordinance on Fisheries B.E. 2558 (2015) (Thai Government, 2015) have economic impacts to the local fishermen individuals and their households (HH), as well as on the commercial fisheries, who previously operated in the coastal zones relatively freely as well.

In 2012 the total marine capture in Thai fisheries was 1,612,073 tons and the total value of exports of fish and fishery product from Thailand sum up to 8.079 billion USD. (UN FAO, 2014)
Established measures to combat IUU fishing since 2014

For the inspections with Port-in and Port-out authorities (PIPO) 32 control centers have been established around the Andaman Sea and the Gulf of Thailand. Port-out control checks the documentation/licenses of the vessels and gives clearance before fishing trips as well as checking on the signal of the Vessel Monitoring System (VMS) which is used to control movement/behaviors and status at sea on all larger/commercial vessel above 10 GT and engines with a horsepower of over 220.

Inspections at the sea are happening with the patrol vessels of the 3 fishing zones control centers for the Thai waters and these are supported by the Royal Thai Navy (RTN) if required.

Upon the landing of the boats the catch is monitored as well as the relevant documentation and log books, in addition to checking the tracking signal and movement history data of the trip recorded by the VMS.

After the landing the catch is inspected and the details are recorded by the authorities and the catch certificates are issues. In case the final products are going to be exported the catch certificates are inspected for validity. (Zwoelfer R., 2018)

In the graphic shown below an overview of how the Monitoring, Controlling and Surveillance (MCS) process in Thailand is working.
Figure 1: MCS Thailand – source DOF (2018) In the next graphic it is shown how the Thai waters are divided into 3 inspection zones, in the gulf of Thailand there are the Rayong and Songkhla patrol centers and in the Andaman Sea there is the Krabi patrol center.
Objective of this work

This paper is aiming at presenting the economic impacts of IUU-fishing and the according counter measurements by government of Thailand to combat this illegal fishing activities on small scale fishermen in Thailand.

2. Materials and Methods

Definition of target population

Small scale fishermen refer to fishermen that would use vessels with the following definitions to be included in the scope of this paper a) small artisanal fishing vessels with engine power less than 180 horsepower (hp) and vessel capacity less than 5 GT and b) large artisanal fishing vessels are fishing vessels with engine power between 180 and 220 horsepower and vessel capacity between 5 and less than 10 GT. The
definition of small and large artisanal fishing vessels is used for this paper is based on the Appendix A of the Marine Fisheries Management Plan of Thailand (Ministry of Agriculture and Cooperatives of Thailand et al., 2015). Household (HH) income is composed of earnings from productive activities and transfers. It is customary to distinguish four main components in the measurement of income: (1) wage income from labor services; (2) rental income from the supply of land, capital, or other assets; (3) self-employment income; and (4) current transfers from government or non-government agencies, or other HHs. (World Bank, 2005).

**Study area and methodology**

The primary data collection method here was a combined quantitative and qualitative approach with a lingual interpreter via semi-structured interviews and was written down on a prepared questionnaire. The interviews were to be conducted within a community with small scale fishermen HH and additionally local authorities and governmental officials or other key informers (KI), and their view on general communal income situation with main income based on fishery. The community of Khan Kradai in Ao Noi in Prachuap Kiri Khan province was found to be a suitable. The bays and the waters around them have been used by local fishermen to catch pelagic, demersal fish and other marine species home at the Gulf of Thailand. Based on average HH numbers, that should be representing a typical fishing community in this area for this research, a community was selected. By applying Yamane's formula (Yamane T., 1967), with a mathematical population of 60, and a precision of +/-10%:

\[
N / (1+N(e)^2) = n
\]

- N=number of households
- e=precision of sample
\[ n = \frac{60}{1 + 60(0.1)^2} = 37.5 \approx 38 \]

The actual number of participating HHs and KIs was 39. (Zwoelfer R., 2018)

**Economic data collected and analyzed**

The data has been collected in a series of field trips to the relevant area by the author and conducted with the help of translators with the villagers directly. In addition, in 2018 short visits to the villagers have been performed to get a post study impression of their overall development.

**Relevancy of data collected**

As there were no detailed data sets previous to this field research in that specific community, a goal was to establish a viable data-base to analyze the economic impacts to affected fishery communities, here of the small scale fishermen, their HHs and communities in the gulf of Thailand. This data should contain economic impact in regards to income of the affected populations and business in the relevant region, as well provide an overview of fishing related issues relevant to the local population. The analysis of this data builds a foundation for recommending appropriate measures to affected communities, local, provincial and national governmental organizations as well as to show where other organizations such as NGOs and the scientific community can contribute to improve the situation. The significance of the first part here can be clearly seen in gaining more data as currently very limited data is available on the socio-economic impacts to affected communities, due to the fact that major reduction of active
fishing vessels is only effectively enacted since the last year 2015, and thus provide valuable data for decision makers and future research. (Zwoelfer R., 2018)

3. Results

Economic findings of the research

Here it will be shown of how the income and cost situation of small scale fishermen has changed since 2014 – the time when more strict governmental laws and related enforcement activities were introduced – and how that development went on until the end of 2016.

![Figure 3](source R. Zwoelfer (2018))

**Figure 3** HHs numbers full-time/ part-time fishing and production and/ or sales – source R. Zwoelfer (2018)

![Figure 4](source R. Zwoelfer (2018))

**Figure 4** Average income fishing and non-fishing activities – source R. Zwoelfer (2018)
Figure 5 Average income fishing and non-fishing activities after fishing expenses –
source R. Zwoelfer (2018)

This results show that the available net income has grown from 2014 to 2015 by
21.7% and went down to 2016 by 23.4%. The lower incomes is not necessarily coming
from lower catch sizes in general, were the drop of only 3.5%, which can be considered
a small change, when there were more restrictions to regrow fish stocks in place.
Another explanation are the year on year seasonal factors. The main cause seems though
to come from higher costs and investments in 2016.

Comparison with non-fishing villagers and national income

In the figures below it can be clearly seen that small scale fishermen and
respectively their households have, compared to the non-fishing population in the
village, a lower average net income per month at their disposal. Also it sees stronger
fluctuations in the total amount.
Figure 6 Comparison fishing and non-fishing households income – source R.Zwoelfer (2018)

Figure 7 data source: Bank of Thailand - National Statistical Office Average monthly wage (Bank of Thailand, 2018)
Figure 8 Comparison target and national household income – source R. Zwoelfer (2018)

The chart above shows also how the average cross sectors national wage incomes and the non-fishing villagers incomes are usually higher than the available net income of a fishing household in the target area.

4. Conclusions and Discussions

Main findings

The stricter regulation on combating IUU-fishing and the stricter enforcement of the regulations especially, seem to have a positive effect on the regrowth of the fish stock which of course are the foundation of the income for small scale fishermen in the target area. Thus the situation for them has improved in regards of IUU fishing related to fish stock in Thai waters.

The revisits in 2018 have shown that the local population has found it easier to catch fish, due to regrowth of fish stock in their areas and the incursions of large scale commercial ships in closed coastal water has nearly ceased.
Discussion and further research

The improved enforcement and consequent updates of the anti-IUU regulations, especially in regards of technological changes to e.g. the fishing gears and boats capabilities, as well as on natural, spatial or temporal changes, have to be a top priority for the relevant governmental institutions. To improve the quality of these processes further other experts of the academia and other stakeholders should be giving in their input as well. And of course last but not least the local fishermen should be heard as well, for example by the inclusion of their local knowledge about the seas in front of their doorsteps, what could help to improve their livelihoods.

The local communities should be enabled to build up resilience themselves against the effects of IUU-fishing and other human made or natural threats to their livelihood. Building up resilience against IUU-fishing effects and other human made or natural threats to their existence should be encouraged by the society in general and get support by the relevant government and non-government organizations. This is necessary in order to allow the small scale fishermen families to improve their lives as well as be protective to their own waters.

Of course more research on this and related areas is needed to further improve the situation of the people and to get more data and improve the processes around it to successfully combat IUU-fishing.

Future outlook

As the situation in regards of IUU-fishing for the fish stock and catches has been improved, in 2017 and 2018 the prices for fish remained low on their markets, according to the local small scale fishermen due to the fact that now the import of fish from neighboring countries has drastically increased. This is according to them due to
the fact that a sharp increase of previously not existing large fishing fleets appeared in neighboring countries.

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