

# Revealing the Socio-economic Features of Small-scale Fisheries in Southeast Asia

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Millions of people around the world are directly engaged in small-scale fisheries, and many millions more are working part- or full-time in up- and down-stream fishing industries. Despite the various aquatic species caught, the different types of fishing vessels and methods used, and an array of management approaches adopted all over the world, resource utilization, impacts, and policy implications are almost the same. Generally, small-scale fishing is known to be a last recourse and is largely left to disadvantaged communities and the poor as their main source of employment and income. As a result, a large number of the poor are into small-scale fisheries, exploiting a large volume of low-value aquatic species mainly for subsistence. Small-scale fishers endlessly struggle to make their ends meet in the midst of the progressively degrading fisheries resources, using outdated gears and outmoded methods, notwithstanding the absence of public facilities. They also have to constantly deal with superior commercial fishing fleets that encroach and damage their inshore fishing grounds. When fishing becomes unproductive, small-scale fishers are forced to seek other alternative jobs as their ultimate means of livelihood even with inadequate relevant skills.

The Southeast Asian region embraces ten countries, namely: Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam, and is bordered by the Andaman Sea and the Indian Ocean on the west, and its eastern border is adjacent to the Pacific Ocean. Fisheries of the region are tropical, multi-species and multi-gear with a great majority of fishers traditionally operate at small-scale level to exploit the natural fisheries resources in whatever means available to them. For such reason, a logical definition of small-scale fisheries for the Southeast Asian region has been difficult to craft. In the absence of an actual definition, SEAFDEC (2000) featured the basic characteristics of the region's small-scale fisheries and the zones exploited by small-scale fishers, while the characteristics of the region's small-scale fisheries were compared with those of commercial fisheries (SEAFDEC, 2003), as means of visualizing the absolute situation of small-scale fisheries in Southeast Asia. Moreover, in order to validate the status of the region's small-scale fisheries, SEAFDEC conducted a socio-economic survey in 2011-2012 in seven (7) of the ten Southeast Asian countries.

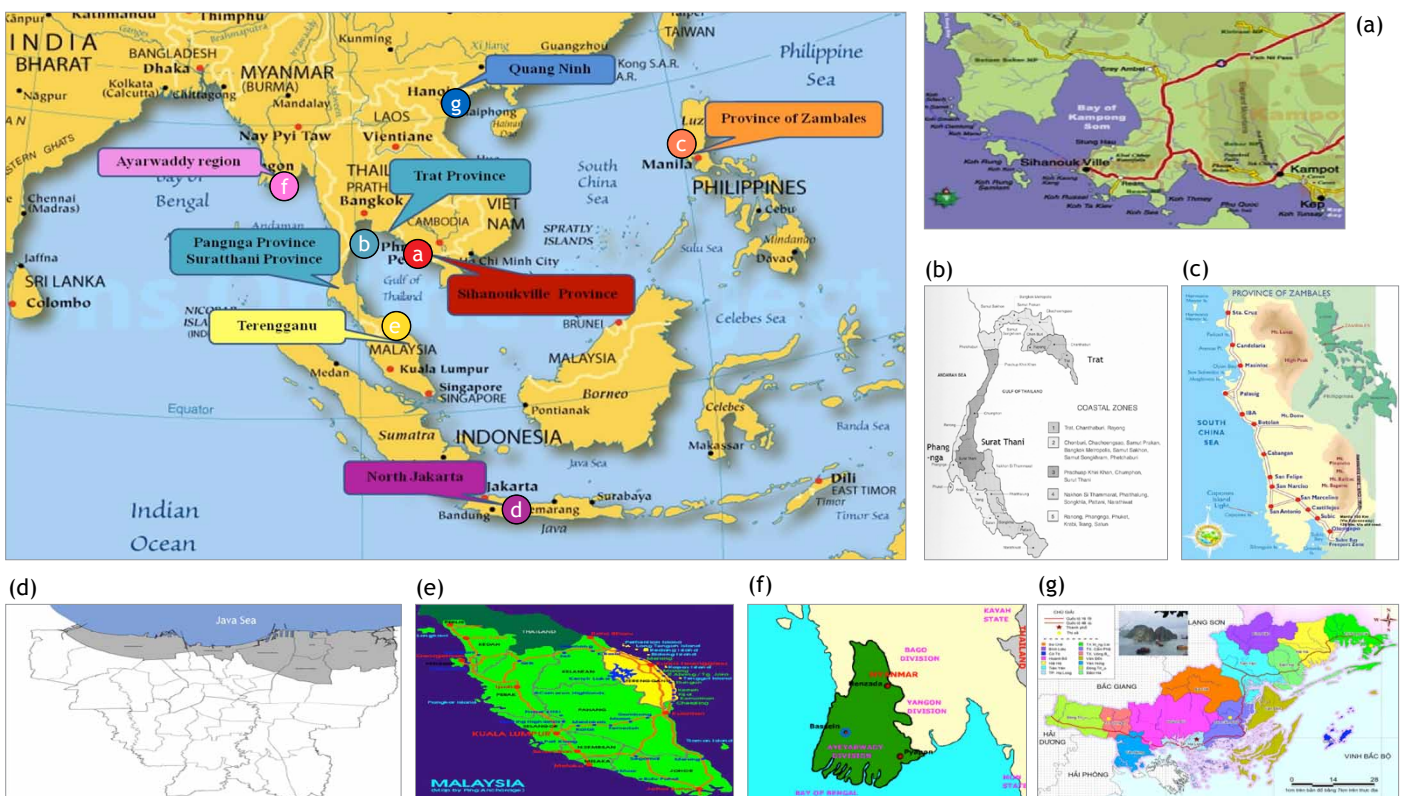


Fig. 1. Approximate locations of the survey's sample sites in: (a) Cambodia; (b) Thailand; (c) Philippines; (d) Indonesia; (e) Malaysia; (f) Myanmar; and (g) Vietnam

**Table 1.** Number of samples for the socio-economic survey of coastal small-scale fisheries in Southeast Asia

Country	Province	District/ Sub-District	Municipal/ Village	No. of samples
Cambodia	Sihanouk ville	Pre Nup Pre Nup II	Chumpou Khmoa Be Krang Chrolong Prey Pross	50
Indonesia	North of Jakarta	Kalibaru	Kelompok Nelayan Punching KUB Kelompok Raja Baca Kelompok Nelayan Lentera Bahari	55
Malaysia	Kuala Terengganu	Marang	Kuala Marang Jambu Bangkok Gong Bali Merchang	54
Myanmar	Ayarwaddy region	Phar Phone	Oauk Kuyin Kala Htike Kan Chaung	50
Philippines	Zambales		Santa Cruz Municipality Candelaria Municipality Masinloc Municipality Botolan Municipality Subic Municipality	49
Thailand	Trad Surat Thani Phang-nga	Mai Root Paknam Thakachai Klong Kien	5 villages of Mai Root 5 villages of Paknam Thakachai 4 villages of Klong Kien	152
Vietnam	Quang Ninh	Van Don	Ha Long village No. 1 Ha Long village No. 2 Ha Long village No. 8 Ha Long village No. 9	52
<b>Total number of samples</b>				<b>462</b>

## Socio-economic Survey of Small-scale Fisheries in Southeast Asia

With financial support from the Japanese Trust Fund through the project on *Promotion of Right-based Fisheries and Co-management towards Institutional Building and Participatory Mechanism for Coastal Fisheries Management*, the socio-economic survey was carried out in 2011-2012 in Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Thailand, and Vietnam. Specifically, the survey

sites were located in areas known to host extensive small-scale fisheries operations as identified by the countries' respective national fisheries authorities (SEAFDEC/TD, 2012). The locations and sample sizes of the survey are indicated in **Fig. 1** and **Table 1**, respectively.

The survey aimed to gather information on three main aspects as indicated in the questionnaire devised for such purpose. These aspects include: General Information in Part I; the Fisheries Sector in Part II, and Part III which covers a number of issues such as the attitude of fishers towards IUU fishing, their participation in enforcement activities, job opportunities available, climate change and adaptation, and safety at sea and energy saving schemes.

## Socio-economic Situation of Small-scale Fishers in Southeast Asia

Providing a background of small-scale fisheries in Southeast Asia is the initial information on the number of fishers and fishing boats as well as on fish production which were compiled through secondary sources. A summary of the information is shown in **Table 2**. The results of the survey manifesting the real socio-economic situation of small-scale fishers in the region are discussed in this paper.

### Age of small-scale fishers

Across the Southeast Asian region, small-scale fisheries have been dominated by fishers in the 41-60 year-old bracket. However, Cambodia and Indonesia have members of the younger generation joining the fishing industry while Malaysia has the most number of fishers belonging to the older generations (**Table 3, Fig. 2**). Specifically, the youngest small-scale fisher in Cambodia is 18 years old while the oldest is 67 years old, and the average age of small-scale fishers is 37 years old. In Indonesia, the 52% of fishers belonging to the 21-40 year-old bracket implies that a considerable number of the country's younger

**Table 2.** Number of fishers, vessels and production from small-scale fisheries of Southeast Asia

Country	Number of fishers (x1000)	Number of Vessels (x1000)	Production (x1000 mt)	No of small-scale vessels as percent of total	Small-scale fisheries production as percent of total fisheries production
Indonesia (Priyono, 2003; Purwanto, 2003)	2,088.0	362.0		90.0	
Malaysia (Abu Talib <i>et al.</i> , 2003)	24.2	15.0	335.0	56.0	29.0
Philippines (Barut <i>et al.</i> , 2003; Cruz-Trinidad, 2003)	743.0	500.0	~500.0	99.0	
Thailand (Boonchuwongse and Dechboon, 2003; Janetkitkosol <i>et al.</i> , 2003)	235.0	43.0		79.0	
Vietnam (Son and Thuoc, 2003)	411.0	9.5	709.0	95.0	63.0

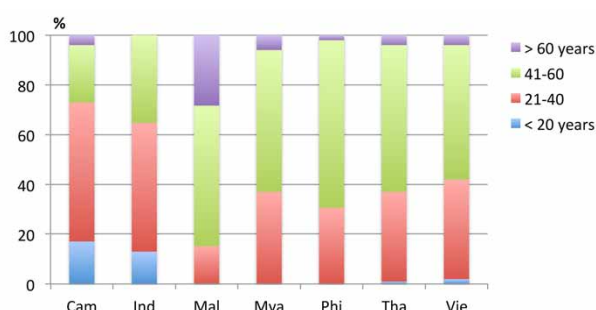
Source: Adapted from Stobutzki *et al.* (2006)

**Table 3.** Age groups of small-scale fishers in Southeast Asia (%)

Age group	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
< 20 years	17.0	12.9	0.0	0.0	0.0	1.0	2.0	5.3
21-40	56.0	51.9	15.1	37.0	30.6	36.0	40.0	38.2
41-60	23.0	35.2	56.6	57.0	67.4	59.0	54.0	49.8
> 60 years	4.0	0.0	28.3	6.0	2.0	4.0	4.0	6.7

**Table 4.** Educational levels attained by Southeast Asian small-scale fishers (%)

Educational Levels	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
None	35.0	14.5	5.5	-	-	10.3	-	9.3
Primary school	58.0	67.3	51.9	40.5	34.0	71.3	62.5	55.1
Senior high school	7.0	18.2	40.7	59.5	57.5	17.2	37.5	33.9
College	-	-	1.9	-	6.4	0.6	-	1.3
Academic degree	-	-	-	-	2.1	0.6	-	0.4



**Fig. 2.** Age levels of Southeast Asian small-scale fishers

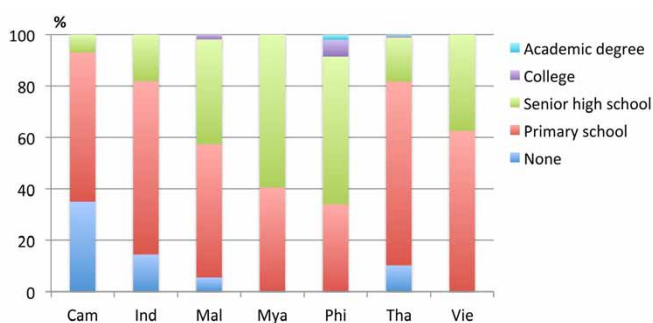
generation has joined the fishing industry. Meanwhile, the high percentage of fishers belonging to the 40-60 year-old bracket, *i.e.* in Malaysia, Myanmar, Philippines, Thailand, and Vietnam, implies that fishers in most countries in the region are already in their late ages.

### Educational attainment of small-scale fishers

Literacy rate which could be measured through formal educational attainment is considered a crucial gauge for enhancing human resource capital based on the grounds that literate people can be trained less expensively, and generally having higher socio-economic status and enjoying better health and employment prospects. Literacy rate is also used as yardstick for creating job opportunities and accessing higher education. In the socio-economic dynamism, the educational level of people currently employed in a particular job, such as in small-scale fisheries could be seen as both a consequence and an attribute. Results of the survey indicated that the highest proportion of non-educated workers in small-scale fisheries comes from Cambodia (Table 4), which could be seen as a consequence as this suggests the inability of the incumbents to get other jobs with better pay or to pursue higher education. Fishing is often seen as the occupation of last recourse and in some countries, this is treated as the job for desperate people. In order to prosper in jobs such as in small-scale fisheries,

governments should be aware that education facilitates efficient communication, and one way of enhancing the knowledge of fishers through training programs is by overcoming the shortcomings of illiteracy. Nevertheless, since most small-scale fishers in the Southeast Asian region have attended primary and secondary schools as indicated in Fig. 3, this indicates that the region's small-scale fishers have the capability to undergo training in the future.

While most of the small-scale fishers of the region have received primary education with a few of them having attended the secondary school level, fishers from Cambodia



**Fig. 3.** Educational attainment of Southeast Asian small-scale fishers



*In Cambodia, family members including children help in cleaning the swimming crab gill net*



have the highest illiteracy rate. In this connection, it is crucial for the governments concerned to devise appropriate communication strategies that would promote maximum comprehension among small-scale fishers during technical information transfer and dissemination.

### Occupation of small-scale fishers

Fishing is almost an exclusive job and could be highly rewarding as many job holders have stayed with small-scale fisheries although this could be due to their inability to get better-paying jobs. The former scenario reflects the relatively assumed profitability of fishing which in reality is not always the case. For the latter case, majority of job holders in small-scale fisheries in Cambodia are also working in agriculture (Table 5) which could be associated with their perceptions about the bleak prospects of job security in small-scale fisheries. Nonetheless, most small-scale fishers in the region are dependent on fishing alone for their livelihoods (Fig. 4), and during the survey most small-scale fishers cited that when fishing becomes difficult especially during monsoon seasons and when the sea gets

very rough, they devote more time in other occupations in order to earn some incomes.

### Income levels of small-scale fishers

Results of the survey revealed that the monthly income of small-scale fishers in the region is less than USD 150.00 (Table 6). Although many fishers consider this amount sufficient for their daily subsistence, they also cited that very little amount is left for their savings, investments, and payment for depreciation costs of their fishing boats and gear.

As illustrated in Fig. 5, Philippines showed the highest percentage of fishers earning less than USD 150.00 per month followed by Indonesia. This could be due to the high number of fishers (Table 2) sharing the bounties of the sea and the total number of days that they could go fishing considering the frequency of typhoons that occur throughout the year. While the average monthly income of small-scale fishers in the Philippines was USD 138, fishers from Vietnam had the highest average monthly income of

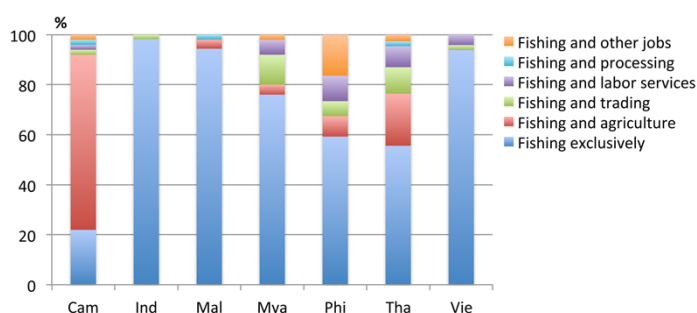


Fig. 4. Dependence of Southeast Asian small-scale fishers in fishing

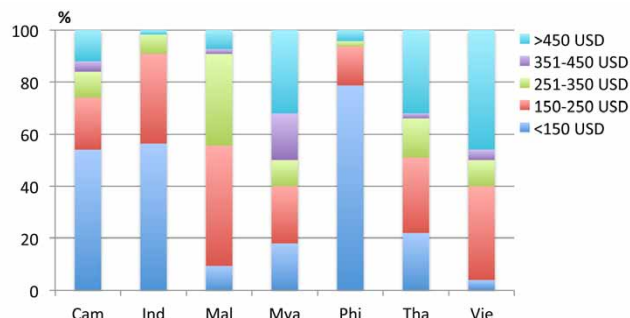


Fig. 5. Income levels of Southeast Asian small-scale fishers

Table 5. Major occupations of Southeast Asian small-scale fishers (%)

Occupation	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
Fishing exclusively	22.0	98.2	94.4	76.0	59.2	55.5	93.9	71.3
Fishing and agriculture	70.0	-	3.7	4.0	8.2	20.9	-	15.3
Fishing and trading	2.0	1.8	-	12.0	6.0	10.6	2.0	4.8
Fishing and labor services	2.0	-	-	6.0	10.2	8.4	4.1	4.4
Fishing and processing	2.0	-	1.9	-	-	2.0	-	0.8
Fishing and other jobs (tourism and government services)	2.0	-	-	2.0	16.4	2.6	-	3.4

Table 6. Monthly income earnings of Southeast Asian small-scale fishers (%)

Income	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
<150 USD	54.0	56.4	9.3	18.0	78.7	22.0	4.0	34.2
150-250 USD	20.0	34.5	46.3	22.0	14.9	29.0	36.0	29.1
251-350 USD	10.0	7.3	35.2	10.0	2.1	15.0	10.0	12.8
351-450 USD	4.0	-	1.8	18.0	-	2.0	4.0	4.4
>450 USD	12.0	1.8	7.4	32.0	4.3	32.0	46.0	19.5

**Table 7.** Monthly expenditures of Southeast Asian small-scale fishers (%)

Expenditures	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
<150 USD	50.0	52.8	40.7	30.0	77.8	21.0	32.0	44.2
150-250 USD	40.0	35.9	38.9	26.0	17.8	35.0	40.0	32.6
251-350 USD	2.0	9.4	20.4	25.0	2.2	27.0	14.0	14.5
351-450 USD	2.0	1.9	-	5.0	2.2	1.0	6.0	2.5
>450 USD	6.0	-	-	14.0	-	16.0	8.0	6.2

**Table 8.** Loans of Southeast Asian small-scale fishers (%)

Loans	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
No loans	28.0	43.6	83.3	42.0	77.6	32.0	48.0	50.6
With loans	72.0	56.4	16.7	58.0	22.4	68.0	52.0	49.4



In Indonesia, family members including children help in post-harvest processing to earn additional incomes for their families

USD 597, followed by Myanmar at USD 503, and Thailand at USD 446. Results of the survey also indicated that small-scale fishers from Vietnam have the highest average savings (income less expenditures) at USD 296 per month followed by Thailand at USD 167 per fisher per month. Consequently, fishers from Indonesia and the Philippines have the lowest savings at USD 11 and USD 31 per fisher per month, respectively.

### Level of expenditures of small-scale fishers

The small-scale fishers' low monthly incomes imply that their expenditures are also low at less than USD 150 (Table 7). While major portions of their incomes are spent mainly on items meant for household consumption as well as on the education of their children, very little amount is left from their earnings for other needs of one's better life.

While small-scale fishers from the Philippines have the lowest average monthly expenditure at USD 107, small-scale fishers from Indonesia spend an average of USD 137 per month (Fig. 6). In Malaysia, the average expenditure is USD 186 per fisher per month since the size of its fisheries households is 5.6 persons, which is higher than in any other countries.

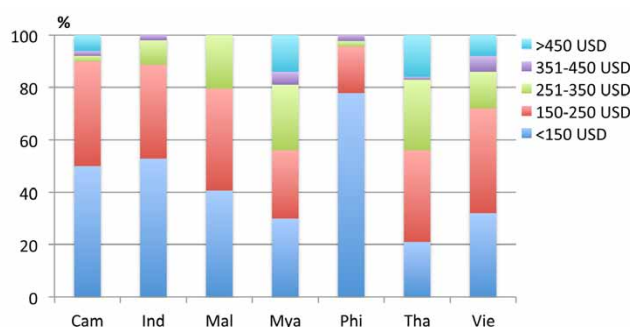


Fig. 6. Average monthly expenditures of Southeast Asian small-scale fishers

### Debts and sources of loans of small-scale fishers

Although considered as conflicting paradigms in small-scale fisheries, “indebtedness” and “investment” normally reflect the need to take loans. A general concurrence to the notion that taking loans for good investments is favorable but borrowing money to meet someone's household needs is considered rather unfortunate. Results of the survey indicated that an almost equal number of small-scale fishers from the region are with loans and without loans (Table 8).

While Malaysia had the highest number of fishers without loans followed by the Philippines, Cambodia had the highest number of fishers with loans followed by Thailand (Fig. 7). In the case of Cambodia, loans are being obtained

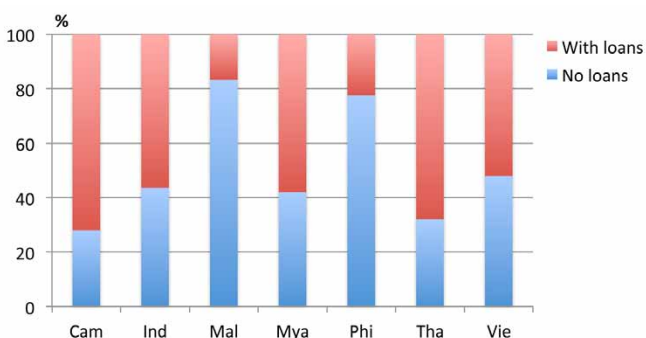


Fig. 7. Status of loans of Southeast Asian small-scale fishers

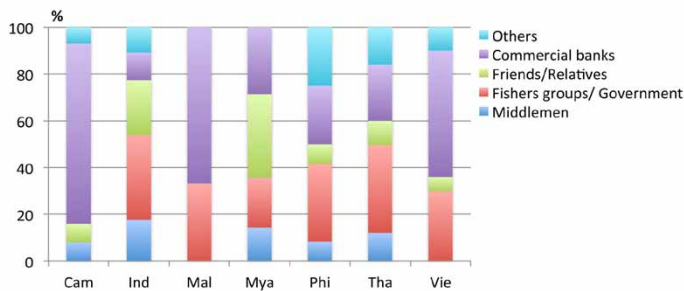


Fig. 8. Major sources of loans of Southeast Asian small-scale fishers

by fishers in order to increase their investments in fishing operations as well as in other economic activities.

The most important sources of loans of the region’s small-scale fishers are commercial banks (Table 9, Fig. 8), specifically for Cambodia in view of the absence of micro-credit systems maintained by the government or fishers’ groups like those available in other countries such as in Thailand. Although Malaysia had the lowest number of loan-takers, the loans they obtained are used mainly to increase investments in fishing boats and engines, boat repair, and other investments related to their fishing operations.

### Fishing proficiency of small-scale fishers

In the absence of other measures or yardsticks to express fishing proficiency, the number of years of experience in fishing in 10-year intervals was used, as shown in Table 10 and Fig. 9. The results showed that fishers from Malaysia were the most experienced followed by those from the Philippines. Although the experience of fishers from Cambodia may be considered as among the lowest, it should be noted that Cambodia had the youngest fishers while Malaysia had the oldest. In some 40 coastal fishing villages of Cambodia, about 1.0 million people are active in fishing and processing.

Malaysia which has the highest fishing proficiency, small-scale fishers preferred to be called “seasoned fishers” for having been fishing for more than 30 years or an average of 30.1 years in fishing, a trend that could have been brought about by the progressive reduction of the number of small-scale fishers. In Indonesia, a little less than one-half of its fishers could be considered experienced for having been in fishing for 21-30 years but a little more than one fourth could still be considered as novices for having entered into fishing in less than 10 years time. This group comprises a considerable number of younger generation fishers who could enhance the country’s strong workforce in the future. In the case of Vietnam, the considerably high number of experienced fishers is consistent with the average age of fishers at 43 years old, implying that most of the country’s fishers belong to the adult generation. For Cambodia, although most fishers fish the whole year, some change their gears to match the seasonal variations of the fish stocks contributing to their fishing proficiency which is quite low.

### Fishing boats used by small-scale fishers

Most fishing boats owned by the region’s small-scale fishers are made of wood (Fig. 10), with outboard engine, and are licensed. To date, majority of small-scale fishers continue to

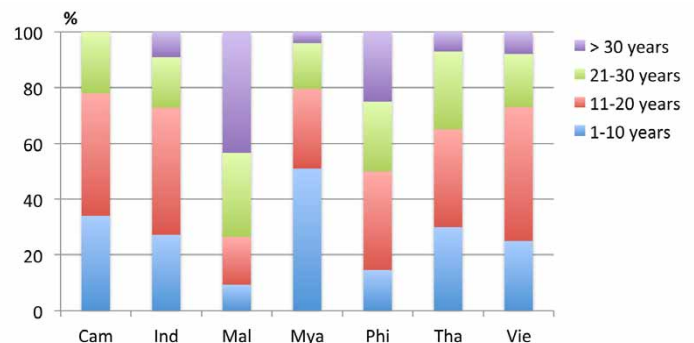


Fig. 9. Experience in fishing of Southeast Asian small-scale fishers

Table 9. Sources of loans of small-scale fishers in Southeast Asia (%)

Sources of loan	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
Middlemen	8.0	17.6	0.0	14.3	8.3	12.0	0.0	8.5
Fishers groups/ Government	0.0	36.3	33.3	21.4	33.4	37.5	30.0	27.4
Friends/Relatives	8.0	23.5	0.0	35.7	8.3	10.5	6.0	13.1
Commercial banks	77.0	11.8	66.7	28.6	25.0	24.0	54.0	41.0
Others	7.0	10.8	0.0	0.0	25.0	16.0	10.0	10.0

Table 10. Fishing proficiency of Southeast Asian small-scale fishers (%)

Fishing proficiency	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
1-10 years	34.0	27.3	9.4	51.0	14.6	30.0	25.0	28.3
11-20 years	44.0	45.4	17.0	28.6	35.4	35.0	48.0	36.2
21-30 years	22.0	18.2	30.2	16.4	25.0	28.0	19.0	21.7
> 30 years	0.0	9.1	43.4	4.0	25.0	7.0	8.0	13.8

use wooden boats, except those in Malaysia where almost all small-scale fishing boats have been changed to fiberglass reinforced plastic (FRP) boats. Meanwhile, Cambodian had the highest number of fishers without boats with a small number also found in the Philippines (Table 11).

Approximately one-third of small-scale fishers in Philippines, Cambodia and Myanmar used non-motorized boats for their fishing operations. In Malaysia, although almost all fishing boats were motorized, about 13% of the respondents disclosed that their boats are not licensed although all its boats are registered. This is quite disturbing because Malaysia is the only country in Southeast Asia where boat registration and licensing are undertaken by one single agency, unlike in other countries where boat registration is done by their respective marine transportation agencies while licensing is the responsibility of fisheries agencies. In Vietnam, almost all boats are wooden but are propelled by outboard engines, measuring 11 m long and registered but most are not licensed. Licensing of small-scale fishing boats is not yet common in Cambodia while almost all small-scale fishing boats in Indonesia and Myanmar are licensed.

### Fishing gear employed by small-scale fishers

The types and distribution of various fishing gears among small-scale fishers could be taken as a sign of progress in fishing gear development, or to certain extent paucity

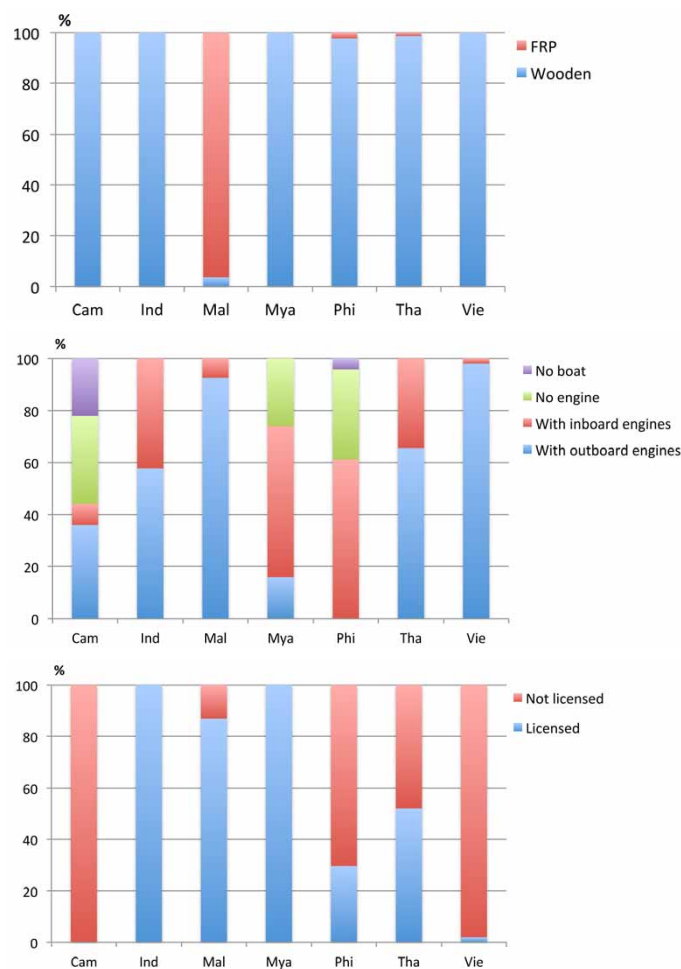


Fig. 10. Types of small-scale fishing boats in Southeast Asia

Table 11. Boats used by Southeast Asian small-scale fishers (%)

Types of fishing boats	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
Wooden	100.0	100.0	3.7	100.0	97.7	98.7	100.0	85.6
FRP	0.0	0.0	96.3	0.0	2.3	1.3	0.0	14.4
With outboard engines	36.0	57.7	92.6	16.0	0.0	65.5	98.0	52.3
With inboard engines	8.0	42.3	7.4	58.0	61.2	34.5	2.0	30.6
No engine	34.0	0.0	0.0	26.0	34.7	0.0	0.0	13.5
No boat	22.0	0.0	0.0	0.0	4.1	0.0	0.0	3.6
Licensed	0.0	100.0	87.0	100.0	29.7	52.0	2.0	54.4
Not licensed	100.0	0.0	13.0	0.0	70.3	48.0	98.0	45.6

Table 12. Major fishing gears employed by Southeast Asian small-scale fishers (%)

Major fishing gear used	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
Gill net	27.0	54.8	64.6	70.0	44.3	61.0	70.0	55.8
Hook & Line	5.0	45.2	29.2	24.0	42.6	1.5	11.0	22.7
Traps (fish and crab)	29.0	0.0	6.2	0.0	3.3	32.0	4.0	10.6
Collection by hand	15.0	0.0	0.0	0.0	0.0	0.0	1.0	2.3
Cast net	2.0	0.0	0.0	3.0	0.0	5.0	3.0	2.0
Others	22.0	0.0	0.0	3.0	9.8	0.5	11.0	6.6



**Table 13.** Major problems encountered by Southeast Asian small-scale fishers (%)

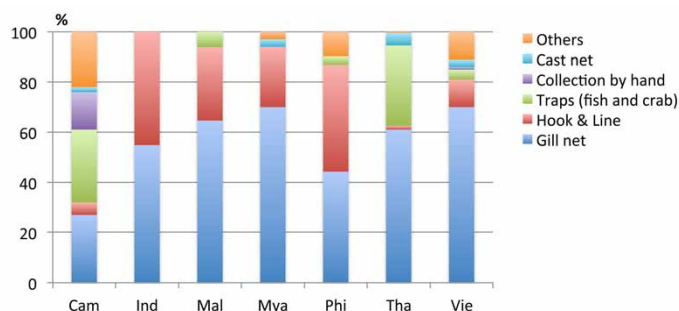
Major problems	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
Degrading fisheries resources	12.0	4.0	16.0	48.6	18.4	28.0	17.0	20.7
High cost of fuel	0.0	13.0	2.0	0.0	7.9	9.6	10.0	6.1
Climate change	38.0	33.0	54.0	51.4	27.6	9.0	23.0	33.6
Low price of fisheries products	0.0	0.0	0.0	0.0	5.3	6.8	0.0	1.7
Illegal fishing	25.0	32.0	28.0	0.0	28.9	42.4	43.0	28.5
Others	25.0	18.0	0.0	0.0	11.9	4.2	7.0	9.4

**Table 14.** Information relevant to the needs of Southeast Asian small-scale fishers (%)

Important Needs	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
Micro-credit	37.0	8.0	5.6	86.2	30.0	11.2	50.0	32.6
Subsidies from governments	30.0	85.0	86.0	13.8	41.7	63.7	31.0	50.2
Installation artificial reefs	0.0	0.0	5.6	0.0	0.0	4.7	15.0	3.6
Strengthening of enforcement units	0.0	0.0	2.8	0.0	6.7	17.4	0.0	3.8
Others	33.0	7.0	0.0	0.0	21.6	3.0	4.0	9.8

to accept and adapt advances in fishing technology at the grassroots level. Results of the survey indicated that a considerable portion of small-scale fishers in Cambodia still uses their hands to catch fish (Table 12). In addition, most of the country's fishers still consider fishing season and conditions of the sea as the most important factors that determine their fishing frequency and the type of gear to be used.

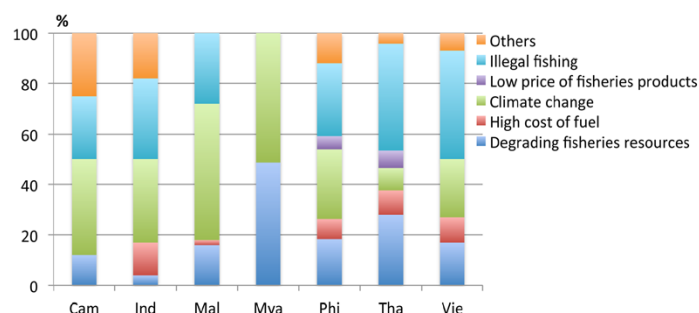
Fish and crab gill net are the most popular fishing gears used although most of the fishers are multiple-gear users. While gill net is very prominent in Myanmar, Vietnam, Malaysia, Thailand, and Indonesia, the use of stationary gears such as traps is quite noticeable in Thailand and Cambodia (Fig. 11). For small-scale fishers, different fishing gears are used for certain target species and for certain seasons in specific times of the year. Operations cost is also an important factor especially in Indonesia where hand-line fishing costs as much as USD 257 while the gill netting costs about USD 7-15.



**Fig. 11.** Fishing gears used by small-scale fishers of Southeast Asia

### Major problems encountered by small-scale fishers

The main constraints of the region's small-scale fishers are mostly related to social, economic and human rights aspects which according to fishers, have led them to poverty and resulted in their vulnerability. Respondent-fishers cited that the most serious problems include the impacts of climate change (strong winds, high waves, siltation of major waterways), and illegal fishing (Table 13 and Fig. 12). Another major concern raised was on the continuing conflict among fishers as results of the progressively dwindling fisheries resources that adds to increased fishing pressure.



**Fig. 12.** Major concerns of small-scale fishers in Southeast Asia

In addition, limited access to credit for the maintenance of their fishing boats, gears and other equipment was also mentioned by the respondent-fishers, thus, assistance from the government in terms of establishing savings groups or micro-credit schemes was requested. Moreover, encroachment by trawlers to the inshore fishing grounds, and meager and unpredictable income from fishing was also among the concerns raised. In this connection, installation



of artificial reefs was suggested to keep trawlers away from inshore fishing grounds, and that governments should consider the promotion of more efficient boats and gears. Some fishers also considered dynamite fishing and fish trapping in coral reefs as among their major concerns. In this regard, Malaysia's exit-plan and buy-back programs could be considered as an example for addressing fishing capacity and conservation of fisheries resources (Shaupi *et al.*, 2011).

### Important needs of small-scale fishers

Most small-scale fishers suggested that subsidies could help them get through, especially for their fishing gear and fuel requirements. In addition, natural resources should be restored through installations of more artificial reefs, and replanting of mangroves to enhance the fishing habitats (Table 14 and Fig. 13). Some fishers are also willing to diversify into other livelihoods such as in aquaculture perceiving it as an option that could offer them opportunities to improve their incomes.

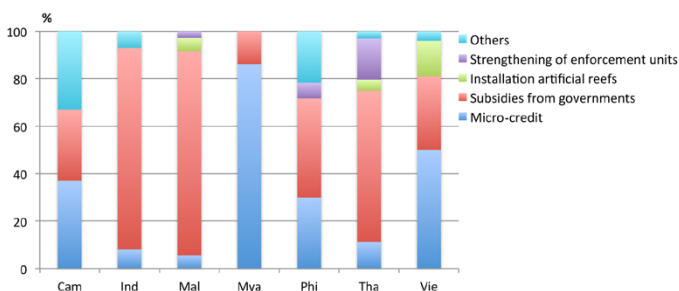


Fig. 13. Urgent needs of small-scale fishers in Southeast Asia



Small fishing boats in Indonesia

### Awareness of small-scale fishers with regards to IUU fishing

Small-scale fishers in the region are not very much aware of the need to mitigate illegal, unreported and unregulated (IUU) fishing (Table 15 and Fig. 14). However, they acknowledged knowing some general concepts, e.g. illegal fishing and fisheries laws, while also being aware of the need to adopt certain fisheries management measures enforced under their respective fisheries laws and associated regulations, such as prohibition of fishing of undersize fish/shellfish, use of small mesh size nets and other irresponsible fishing practices, and banning the practice of dynamite fishing.

While recognizing the significance and impacts of such practices as no fishing during closed season and no operation of destructive fishing gears, some fishers also acknowledged the importance of registration of their fishing boats as this could help in regulating IUU fishing. Nevertheless, many fishers have not yet obtained fishing licenses and have remained unaware of the advantages of using logbooks.

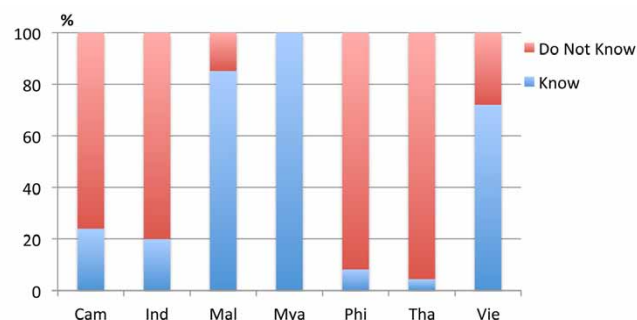


Fig. 14. Level of awareness of Southeast Asian small-scale fishers on IUU fishing

### Participation of small-scale fishers in law enforcement

Most small-scale fishers do not participate in fisheries law enforcement (Table 16 and Fig. 15) or assist fisheries law enforcers in carrying out their duties, due to perceived inadequacy of government support. However, a few takes

Table 15. Awareness of Southeast Asian fishers about IUU fishing (%)

IUU Fishing	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
Know	24.0	20.0	85.2	100.0	8.2	4.5	72.0	44.8
Do Not Know	76.0	80.0	14.8	0.0	91.8	95.5	28.0	55.2

Table 16. Participation of Southeast Asian small-scale fishers in law enforcement (%)

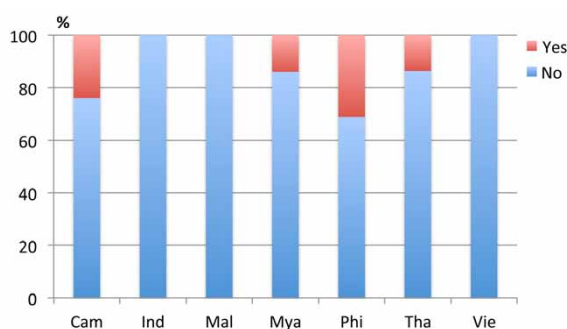
Participation in Enforcement	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
No	76.0	100.0	100.0	86.0	68.8	86.3	100.0	89.6
Yes	24.0	0.0	0.0	14.0	31.2	13.7	0.0	10.4

**Table 17.** Perceptions on the need for diversification of small-scale fishers' livelihoods (%)

Need for livelihood diversification	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
Necessary	68.0	14.5	5.6	42.0	75.5	20.5	30.0	36.6
Not necessary	32.0	85.5	94.4	58.0	24.5	79.5	70.0	63.4

**Table 18.** Alternative livelihoods identified by Southeast Asian small-scale fishers for diversification (%)

Alternative livelihoods	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
Agriculture	34.0	7.1	37.1	28.6	6.3	13.0	11.0	19.6
Trading	19.0	64.3	14.3	61.9	39.6	18.0	22.0	34.2
Aquaculture	16.0	0.0	11.4	0.0	10.4	30.0	50.0	16.8
Labor services	7.0	3.6	2.8	4.7	16.6	16.0	0.0	7.2
Handicraft making	0.0	17.9	2.9	0.0	2.1	5.0	0.0	4.0
Others (tourism, processing)	24.0	7.1	31.5	4.8	25.0	18.0	17.0	18.2

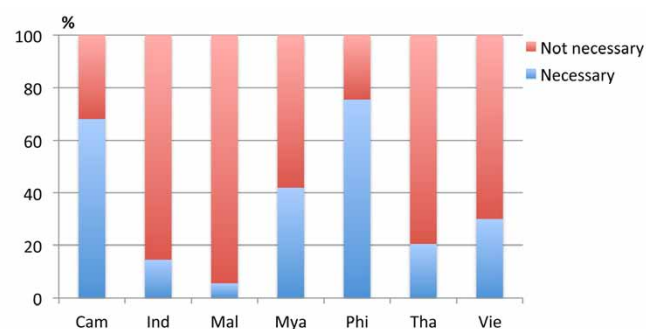


**Fig. 15.** Level of participation of Southeast Asian small-scale fishers in law enforcement

part in the enforcement by assisting relevant fisheries agencies' officials in patrolling the fishing grounds and in conducting relevant activities carried out by the governments' patrol boats.

### Diversification of small-scale fishers' livelihoods

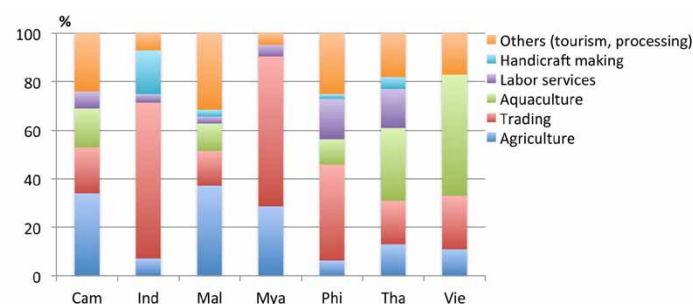
Almost all small-scale fishers indicated that they would continue fishing and do not want to look for other jobs (Table 17 and Fig. 16) owing to their deficiencies in terms of skills, insufficient capital such as land or funds for new investments, inadequate educational background and



**Fig. 16.** Perceptions of Southeast Asian small-scale fishers with regards to diversification of livelihoods

training, and lack of pertinent skills necessary for other jobs. They are also not comfortable with changing new lifestyle having been in fishing activities almost all their lives, and have always considered fishing as an easy way to earn money with no limit of time.

Fishers who opted to look for some new jobs preferred to go into trading followed by agriculture and aquaculture (Table 18 and Fig. 17), which seems to imply that fishing can no longer be entirely depended on as main source of income. Their physical conditions also influenced some fishers to



**Fig. 17.** Possible alternative livelihoods identified by Southeast Asian small-scale fishers for diversification



Small-scale fishing community in Thailand

**Table 19.** Awareness of small-scale fishers on climate change and adaptation measures (%)

Climate change awareness	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
Know	76.0	87.0	100.0	98.0	82.0	98.0	84.0	<b>89.3</b>
Do not know	24.0	13.0	0.0	2.0	18.0	2.0	16.0	<b>10.7</b>

**Table 20.** Confidence of Southeast Asian small-scale fishers on their safety at sea (%)

Safety at sea	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
No	80.0	78.0	76.0	52.0	47.0	41.0	38.0	<b>59.0</b>
Yes	20.0	22.0	24.0	48.0	53.0	59.0	62.0	<b>41.0</b>

**Table 21.** Necessity to promote energy saving schemes for small-scale fishers in Southeast Asia (%)

Energy savings	Cambodia	Indonesia	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Average
Need	96.0	58.0	33.0	12.0	59.0	38.0	26.0	<b>46.0</b>
No need	4.0	42.0	67.0	88.0	41.0	62.0	74.0	<b>54.0</b>

decide in diversifying into other livelihoods considering old age and unstable physique. Nevertheless, those who opted to find new jobs also recognized their apparent inadequacies in terms of knowledge and skills that made them less confident to work in other jobs, and cited that

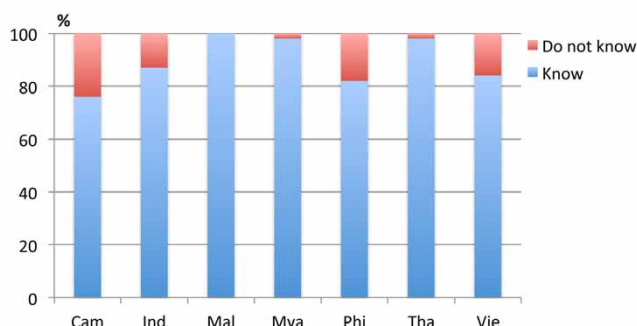
prospects in fisheries are no longer bright as before owing to the dwindling fisheries resources.

### Views of small-scale fishers on climate change and adaptation measures

Most of fishers know and understand the impacts of climate change in fisheries, although many are not aware of the adaptation measures (Table 19 and Fig. 18). Specifically, they are well aware of the changes in climatic conditions that bring about more severe winds and precipitations, rising air and water temperatures, inconsistent seasonal changes of fish stocks, more violent storms, among others. Many fishers attribute such climate changes to natural causes and thus will just have to adapt to such changes. However, other fishers cited that since changes in the climate are results of anthropogenic actions, therefore there is a need for governments to develop mitigation measures.



*In Myanmar: Women mending nets (above) and small-scale fishers prepare to go fishing (below)*



**Fig. 18.** Knowledge of Southeast Asian small-scale fishers on climate change

### Awareness of small-scale fishers on the implications and concepts of safety at sea

Recommendations on safety at sea for small fishing boats in Southeast Asia raised by the ASEAN Technical Officers during the December 2003 Workshop in Bangkok,



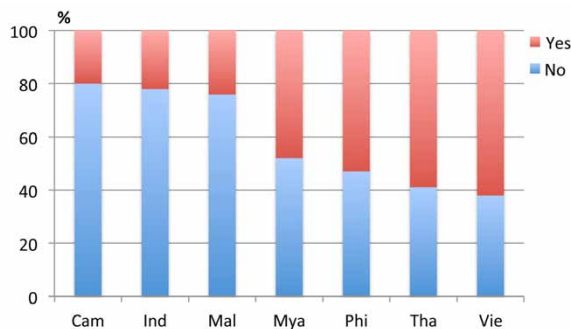


Fig. 19. Perceived safety of small-scale fishers while at sea

Thailand, promote the registration of small fishing boats. Although the definition and operational range of these boats are left to the discretion of individual countries, the recommendations include the basic requirements for safety at sea such as appropriate design and construction of small fishing boats, bringing safety equipment onboard including fire fighting and life-saving appliances, and complying with regular boat inspection systems.

During the survey, some fishers expressed confidence that their present gear and equipment could ensure their safety while fishing at sea (Table 20 and Fig. 19), although they also expressed some fears about their safety at sea due to the unpredictability of the weather conditions. The fishers therefore suggest that the government could



Most common safety gadget brought onboard small fishing boats in the Philippines

address their concern by providing life jackets and assisting them to improve their accessibility to weather forecasts through the development and promotion of top-of-line telecommunication facilities as well as improvement of search and rescue systems.

### Energy savings as perceived by small-scale fishers

Fuel forms a large portion of the operating costs incurred by fishers while fishing, and saving on fuel and energy costs is a major concern of fishers who are conscious of maximizing profit from fishing operations. During the survey, some fishers expressed the need to have energy saving schemes,

especially fishers from Cambodia, Indonesia and the Philippines although some fishers did not consider this as much of a concern (Table 21 and Fig. 20). Most fishers feel that energy saving schemes could help them cut on operation costs and preserve the health of the ecosystem. Nevertheless, the fishers also have a vague idea on the form of energy saving schemes that would be promoted and on how such schemes would be adopted.

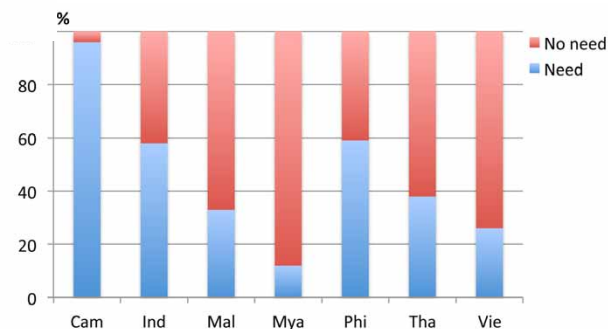


Fig. 20. Perceptions of small-scale fishers on the need for energy saving schemes

## Discussion and Conclusion

From the information compiled through this socio-economic survey, the conditions of small-scale fisheries in Southeast Asia could be visualized. The basic characteristics of the region's small-scale fishers are also featured in this article to justify why small-scale fishers are among the least privileged and the poorest in our society. Nevertheless, the information on age and education of small-scale fishers in Southeast Asia seems very interesting.

Through such information, the manpower strength in the coming decades could be perceived as members of the younger generations of fishers in some countries are starting to take control of the fishing industry, especially in Cambodia and Indonesia although some fishers in other countries are already in the twilight period of their existence. Meanwhile, the compiled data on the



Small-scale fishing boats in the Philippines



educational attainment of fishers should enable the respective governments to craft appropriate training plans and programs for building human resources in fisheries.

The perceptions of fishers on the issues related to illegal fishing and climate change should provide governments with information that could be used in developing plans for coping with the environmental changes. Such plans could be introduced through training, especially in promoting the fisheries co-management approach as well as ecosystem approach to fisheries management. The small-scale fishers' expressed needs to improve their socio-economic conditions (*e.g.* accessibility to loans and establishment of micro-credit schemes) would provide the governments with possible means of addressing the fishers' concerns such as through the establishment and strengthening of fishers' groups.

The expressed need of small-scale fishers to look for optional jobs portrays not only the seasonality of fish stocks but also the need to adapt changes in their fishing gear, fish handling as well as in value-adding. For small-scale fishers, any other jobs that would help them earn additional incomes when fishing is difficult or impossible due to severe weather conditions, would mitigate their difficult situation. Dire needs for optional jobs as strongly expressed by fishers from Cambodia and the Philippines reflect the volatility of fishing operations, so that optional jobs in other fields could be a possible and essential way out from the fishing industry.

The reluctance of fishers to participate in law enforcement could provide the national authorities with means to ponder on the present fisheries management regime, together with its cost and effectiveness. The attitude of fishers to participate in law enforcement should be taken into consideration during the promotion of fisheries co-management. Awareness of small-scale fishers with regards to IUU fishing should be enhanced by intensifying the advocacy of the issue, considering that the term and scope of IUU fishing are largely applicable in small-scale fisheries, but are understood only by higher levels in fisheries management. Nevertheless, some of the practical mitigation measures, such as minimizing the encroachment of commercial fishing vessels to inshore areas, should be considered as these are well understood by the small-scale fishers.

On safety at sea, many fishers are confident with their present situation and the provisions onboard. However, they are more concerned about the frequent and severe changes in weather conditions that threaten their safety while fishing. Although not very willing to adopt energy

saving schemes, the fishers are satisfied with their current energy use as this contributes to smaller share in their fishing expenses. Small-scale fishers mostly operate in near-shore fishing grounds which usually takes them a shorter trip and less energy used.

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