

National Report on bycatch management and reduction of discards
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SECTION 1: OVERVIEW AND SCOPE OF PROJECT

I. National overview of trawl fishery (all fisheries):

- Overview of (bottom) trawl fisheries:
 - *Locations, types and estimated numbers of vessels, fishing effort*

Number of trawlers operating in Vietnam waters has been highly fluctuated in recent years. Total number of trawlers which fishing the main categories of aquatic resources including fish, shrimp, crabs, squids, cuttlefishes was approximately 17,500 units in 2007 and 16,400 units in 2008 respectively (DECAFIREP, 2009). Accordingly, quantity of shrimp trawlers has been considerably declined. While the number of shrimp trawlers shifts to other fisheries and/or using integrated gears tends to climb up in recent years. Trawl fishery occur in all four main regions, the North (I), the Center (II), the Southeast (III) and the Southwest (IV) of Vietnam, however, mainly concentrate in areas I, III and IV (Figure 1). In the Northern part, the dominated provinces in terms of owning number of trawlers are QuangNinh, HaiPhong, ThanhHoa, Nghe An while in the Central area, provinces namely Quang Nam, QuangNgai, KhanhHoa account for the major proportion. BinhThuan, Vung Tau, TienGiang and BenTre play an important role in total fishing effort of trawler fleets in the Southeast area. In the Southwest area, KienGiang and CaMau account for main quantity of trawler fishing boats in the region (Table 2).

Table 1. Number of trawlers by types and areas in Vietnam during 2007 – 2008.

Otter trawls	Areas	2007	2008
	The North	4,266	4,755
	The Center	3,207	2,666
	The Southeast	6,473	6,447
	The Southwest	3,631	2,558
	<i>Sub-total</i>	<i>17,577</i>	<i>16,426</i>
Pair trawls	The North	915	976
	The Center	934	2,419
	The Southeast	810	2,489
	The Southwest	1,858	1,781
	<i>Sub-total</i>	<i>4,517</i>	<i>7,665</i>
Total:		22,094	24,091

Table 2. Number of otter trawlers by HP groups, provinces and areas of Vietnam in 2007.

Areas/Provinces	< 20 (HP)	20 - <50 (HP)	50 - < 90 (HP)	90- <250 (HP)	150-< 250 (HP)	250-< 400 (HP)	> = 400 (HP)	Sub- total
1. The North								
QuangNinh	214	862	193					1,269
HaiPhong		468	3	2				473
Thai Binh		4						4
Nam Dinh	224	442	69	16		14	6	771
NinhBinh		7				4		11
ThanhHoa	463	243	216	40	32			994
Nghe An	262	162	4					428
Ha Tinh	50	118						168
QuangBinh		98	48					146
QuangTri		2						2
2.The Center								
Hue	22	115	21					158
Quang Nam	90	266	5	1				362
QuangNgai	16	426	210	93	56	212	40	1,053
BinhDinh	16	132	86		3	2		239
Phu Yen	3	188	86	10				287
KhanhHoa	350	505	253					1,108
3.The Southeast								
NinhThuan	22	58	124	26	5	4		239
BinhThuan		679	482	76	41	12		1,290
Vung Tau	5	114	129	441	893		313	1,895
Ho Chi Minh	63	162	22	6	3	1	1	258
TienGiang	3	64	103	195	13			378
BenTre	156	979	214	154	60	259	25	1,847
Trà Vinh	96	262	136	31	16	25		566
BacLieu	2	49	3	6	31	74		165
SocTrang	217	178	21	14	31	57	3	521
4.The Southwest								
CaMau	53	240	72	55	100	352	20	892
KienGiang	464	735	391	38	139	202	84	2,053
Total(units):	2,791	7,558	2,891	1,204	1,423	1,218	492	17,577

Source: DECAFIREP, 2009.

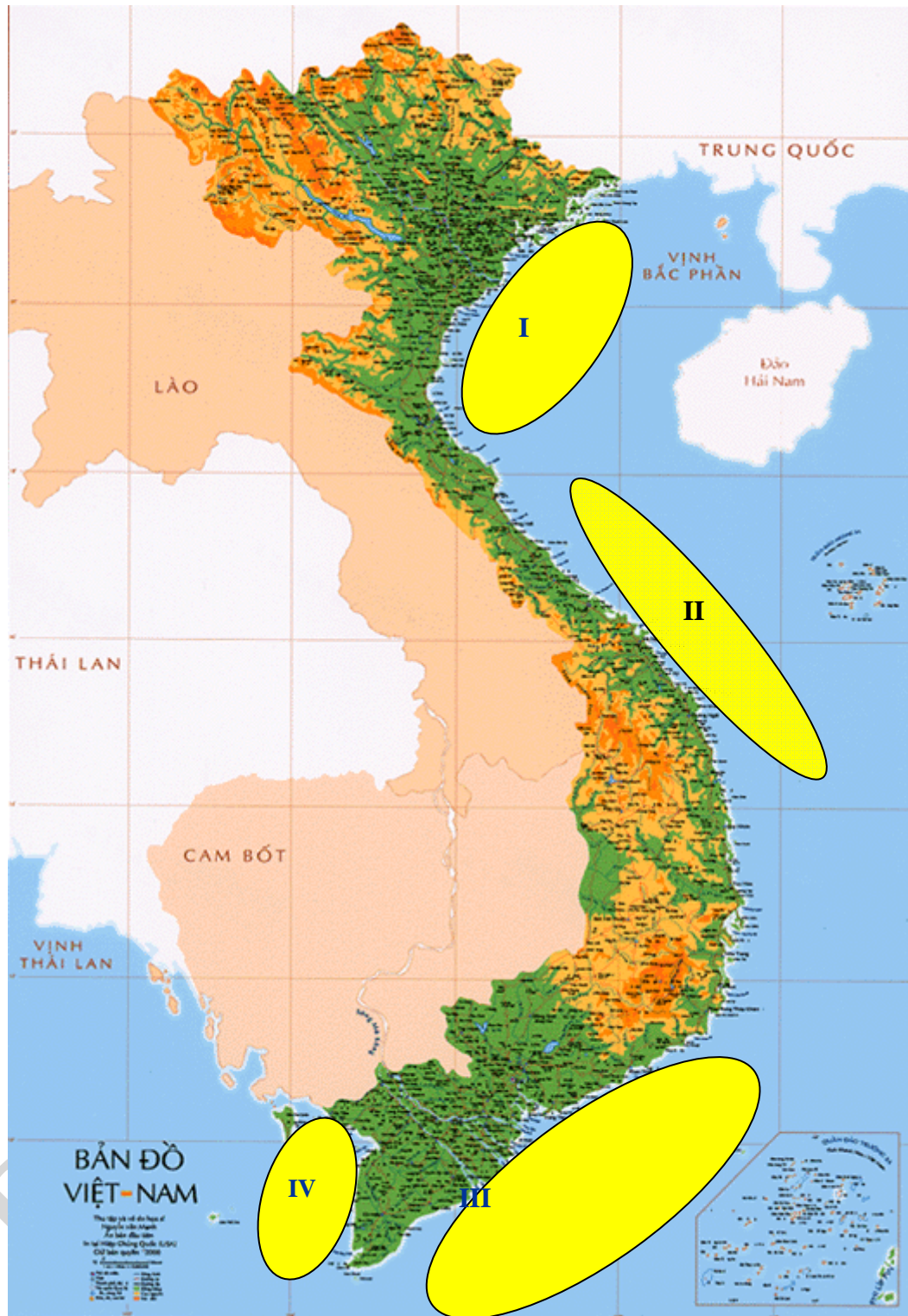


Figure 1. Main fishing grounds for trawl fisheries of Vietnam.

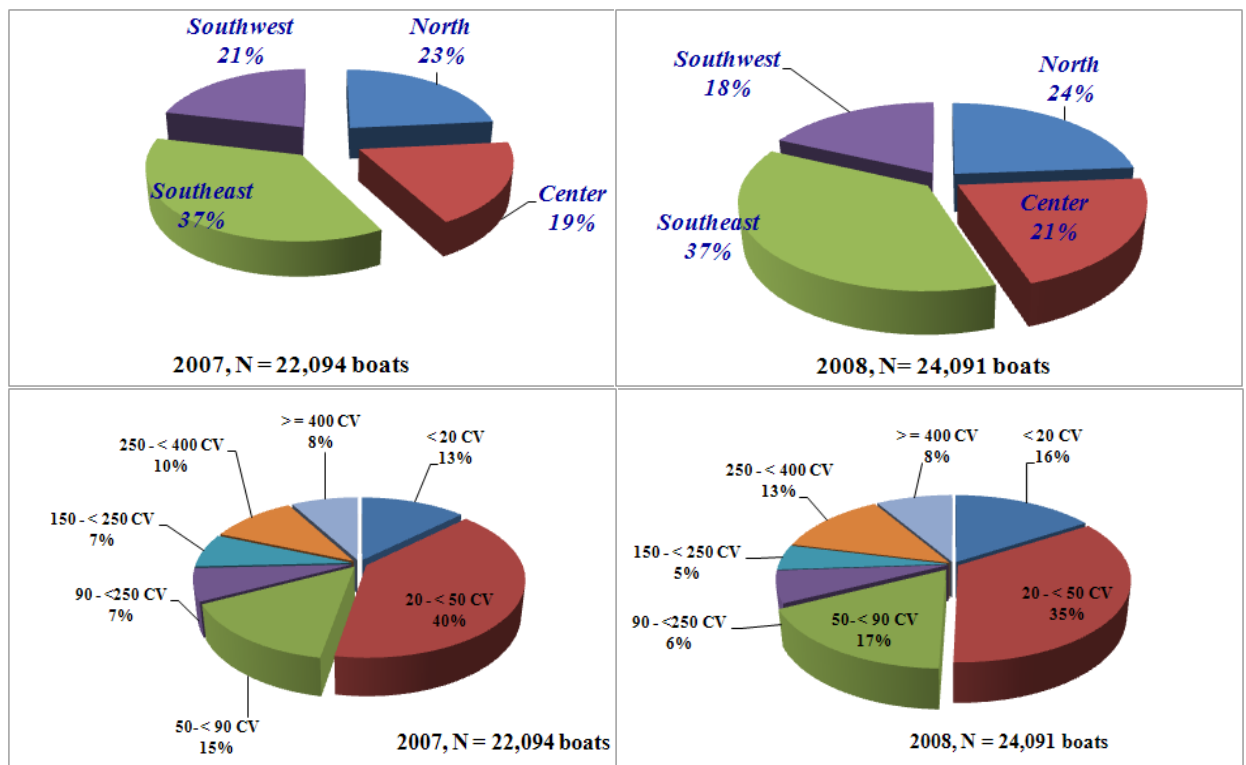


Figure 2. Number of trawlers in Vietnam by administrative areas and fleets (Horse Power groups).

- **Catch quantities, catch values, species harvested and production trends**

Under the framework of ALMRV project (Assessment of the Living Marine Resources) supported by DANIDA, the enumerator program had been carried out in the whole areas of Vietnam. However, not all fisheries had been collected commercial data related to catch composition, species composition; fish caught sizes, fishing efforts... Due to lack of sufficient data on BAC (Boat Active Coefficient), therefore the estimates of quantities of landing by fishing fleets were not accurate. At that time there was a debate between international consultants and Vietnam government on the outputs/results of the project regarding to the total catches estimated. Due to lack of routine work in landing data collection, there is a debate in estimate of total marine capture fish product and particularly group of trashfish by fishing gears and areas. According to previous estimate of the total annual trashfish landed of Vietnam, it largely varied from 300,000 – 600,000 tones while about half of them is used as materials for fishmeal processing (*Dao et al, 2005*). However, the enumerator program running by RIMF showed that this quantity is considerably higher compared to the number mentioned above. And, the total trashfish landed of the nation could be around 930,000 tones (*Edwards et al., 2004*). Trashfish is normally sold with very low

prices, just one to two tenth price of mixed fish commercial groups sold at local market for people consumption.

In trawl fisheries of Vietnam, trashfish is relatively diverse in terms of species composition; however, anchovies, threadfin porgies, puffer fishes, goatfishes, lizard fishes, pony fishes, flounders etc are frequently occurred in this group. Some studies indicated that there are about one hundred of fish species presenting in catch of trawlers which are considered as bycatch fish.

With the difficulties motioned above, this paper only presents some relative information and describes the general views of trashfish landed by some important fishing fleets categorized by engine Horse Power (HP). The background area with the horizontal lines presented of the figure 3 shows the lack of data collected by enumerators. Notwithstanding, trashfish group shows a high fluctuation by fishing seasons and years. Nevertheless, the quantity of trashfish in fishing fleet with engine capacity less than 20 HP in the Southeast area is relatively small compared to shrimps and mixed fish.

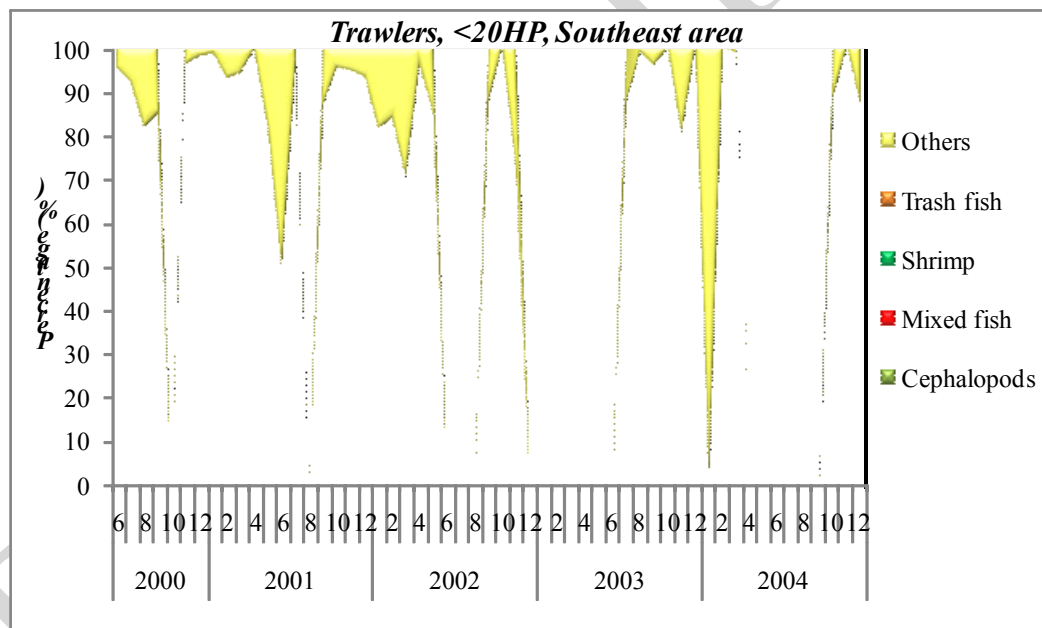


Figure 3. Proportion (%) of trashfish in total landing catch by trawlers of less than 20 HP in the Southeast area during 2000 – 2004.

Trashfish caught and landed by trawler fleets of 21- 45 HP in the Southeast area varied from 17% to 27% total catch landed. On average, this group accounted for 24% of total landing of this kind of fleets. Geographically, the proportion of trashfish presented in landing catch of these trawlers is described in the following table.

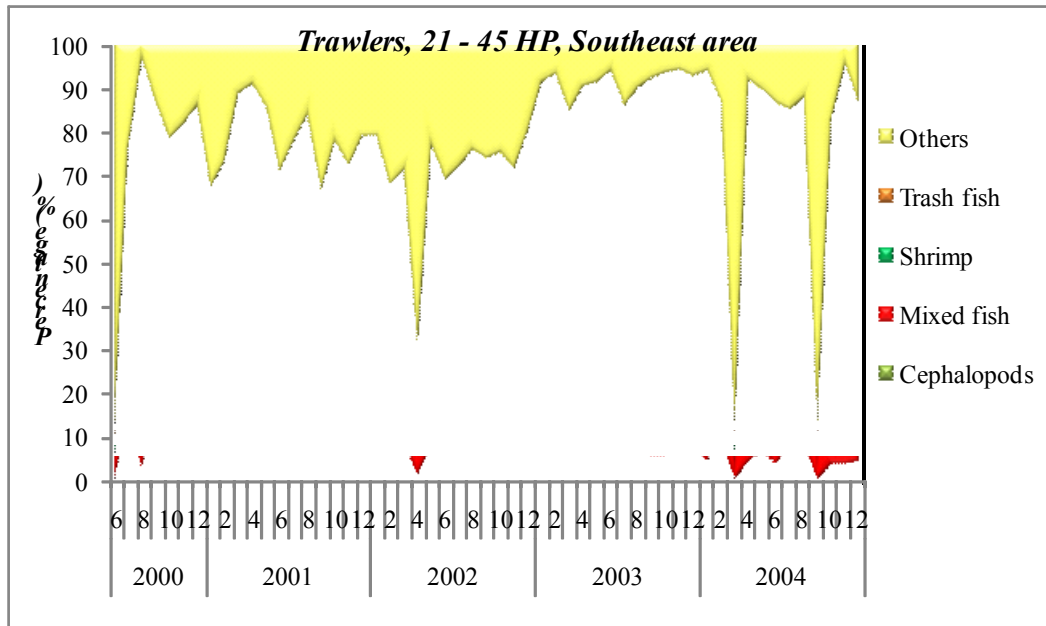


Figure 4. Proportion (%) of trashfish in total landing catch by trawlers of 21-45 HP in the Southeast area during 2000 – 2004.

The percentage of trashfish in catches landed of bigger trawlers, 46-89 HP, in the Southeast area was fairly stable during 2000-2004. The mean value of this proportion was estimated at 20%. And the lowest value observed was 16% (2004) and the highest one was 23% (2003).

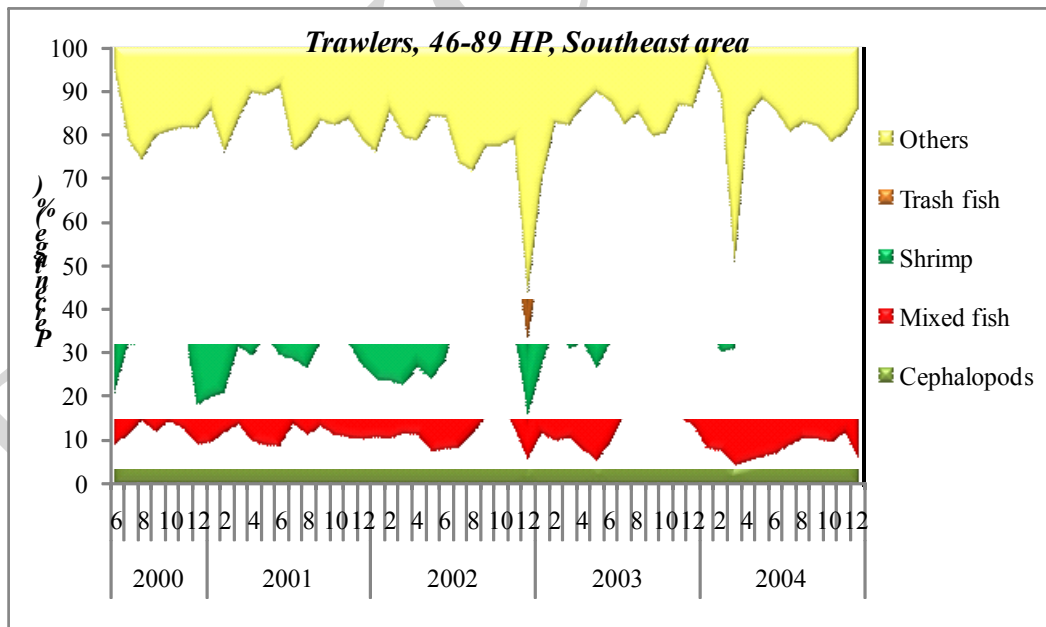


Figure 5. Proportion (%) of trashfish in total landing catch by trawlers of less than 46 - 89HP in the Southeast area during 2000- 2004.

Even though, owning higher capacity, there is no significant less in catching trashfish of the trawlers equipped with engine capacity of 90-140 HP. Conversely, these fishing vessels tended to fish more trashfish, about 25%. Additionally, the relatively

proportion of trashfish captured by these vessels ranged from 20% (2004) to 29% (2003). The lack of data of commercial fisheries which were not available in January 2001, February and August 2003 is also presented in Figure 6.

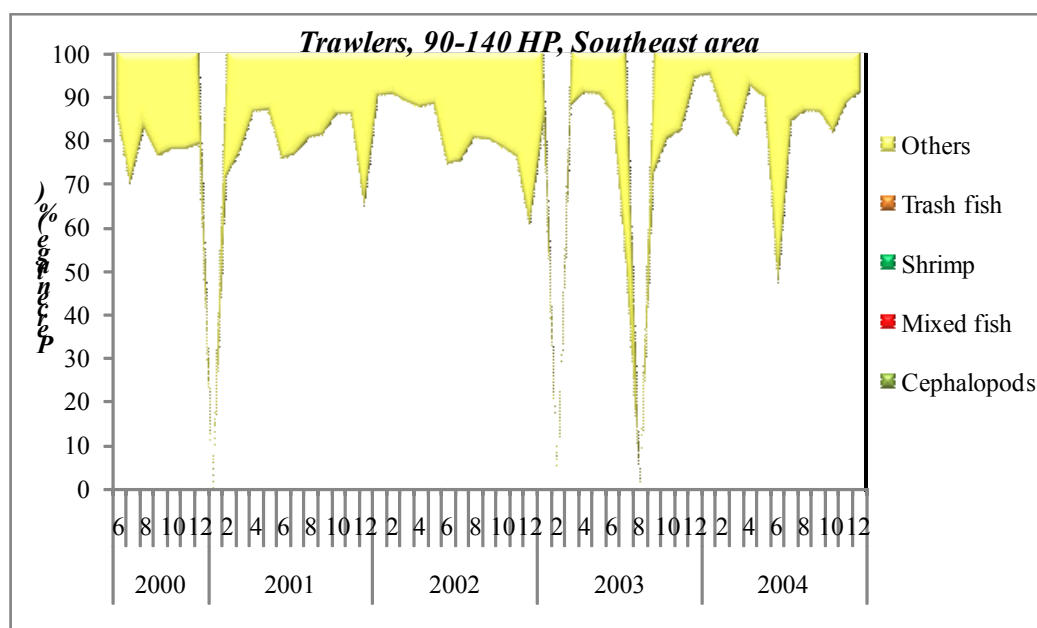


Figure 6. Proportion (%) of trashfish in total landing catch by trawlers of 90-140HP in the Southeast area during 2000 – 2004.

- **Overview of employment in the trawl fishery sub-sector**

General situation of trawl fishermen in Vietnam is a large number of fishermen engaging in the sector. Some fishermen are relatively rich especially who own big fishing boats (>90 CV). Mostly, persons who have small trawlers and chartered labors are poor. Trawl fishermen distribute discretely along Vietnam’s coastal line. They normally move widely from area to another area. Accordingly, all trawl fishermen are male with average age of more than 18 year olds. Generally, they have poor educational knowledge and doing fish for their livelihoods and fishermen working without licenses, knowledge of safety at sea as well as specialist training. They work on their own experiences, basically from generation to generation. Fishermen normally work for boat owners under the “oral contracts”. Allocation of the total revenues, net benefits is varied by fleets and areas or locals. Requirements of safety at sea of fishermen are not paid much attention by boat owners.

- **Estimated number of jobs onboard vessels**

In the past few years, quantity of labors engaged in trawl fisheries of Vietnam showed a notable increase, approximately 95,000 labors (2007) and 102,000 labors (2008). In which there are about 3,000-4,000 small boats (<20 HP) operated by only 2 labors on each. And a large number of relative small boats (20-50 HP) make up 8,200-8,800 boats, are operated by 3

fishermen each. In the period from 2007 to 2008, there are 45,000-47,000 labors working on small trawlers (≤ 90 HP). Detailed information of the quantity of labors engaged by fishing fleets of Vietnam trawl fishery is presented in the following table, *Table 3, Table 4*.

Table 3. Number of labors engaged in trawl fisheries by fleets in 2007.

Rank	Fleets (HP)	No of labors/unit	No of Boats (unit)	Sub-total (lab.)
1	<20	2	2,839	5,678
2	20-50	3	8,827	26,481
3	50-90	4	3,244	12,976
4	90-150	5	1,496	7,480
5	150-250	5	2,322	11,610
6	250-400	8	1,564	12,512
7	>400	10	1,802	18,020
Total				94,757

Table 4. Number of labors engaged in trawl fisheries by fleets in 2008.

Rank	Fleets (HP)	No of labors/unit	No of Boats (unit)	Sub-total (lab.)
1	<20	2	3,825	7,650
2	20-50	3	8,324	24,972
3	50-90	4	4,141	16,564
4	90-150	5	1,513	7,565
5	150-250	5	3,032	15,160
6	250-400	8	1,200	9,600
7	>400	10	2,056	20,560
Total				102,071

○ *Estimated number of jobs in postharvest and other auxiliary activities*

Accordingly, there are about 388,000 labors working on postharvest and processing fishery. Depending on nature of the business, most of labors engaged in the sector are women. Seafood processing and seafood frozen industries account for major quantity of total labors respectively 194,000 and 156,000 labors. *Table 5* describes main enterprises and corresponding number of labor involved in post harvest processing line.

Table 5. Basic information of fisheries postharvest and processing industry in 2007.

Rank	Items	Unit	Number
I	<i>Sea food processing</i>		
1	Number of companies, plants, enterprises	firm	544
2	Labors	Person	194,000
3	Total Export turnover	bill.USD	4
II	<i>Sea food frozen</i>		
4	Number of companies, plants, enterprises	firm	255
5	Labors	Person	156,000
6	<i>Total Export turn over</i>	bill.USD	4
III	<i>Dried processing</i>		
7	Number of companies, plants, enterprises	firm	87
8	Labors	Person	26,000
9	Total Export turnover	bill.USD	0.2
IV	<i>Fish sauce processing</i>		
10	Number of companies, plants, enterprises	firm	268
11	Labors	Person	12,000
12	Total Export turnover	bill.USD	0.1
Total		Person	388,000

Source: Department of Processing Trade for Agro –Forestry – Fisheries Product and Salt.

- ***Distribution / marketing of catch nationally and for export***

- *National human consumption species*

Being located in the tropical area, Vietnam sea water is relatively diverse in terms of fish species, totally about 2,080 fish species identified in which 130 fish species are considered as high economically important species. In addition, 287 mollusk species and snails classified. Moreover, numbers of shrimp and cephalopods have been recorded about 77;18 species respectively. Particularly, demersal fish captured in trawling hauls is normally high in terms of quantity of species. Main fish species captured and consumed by people depends on fishing grounds, fishing seasons and gears used. In catch of fish trawlers, croakers (Sciaenidae), lizardfish (Synodontidae), threadfin bream (Nemipteridae), threadfin porgy (Sparridae), scads (Carrangidae), redbigeye (Priacanthidae) and Snapper (Lutjanidae), groupers (Serranidae), congers (Muraenidae) are the most important species not only in economic term but also in consumer preference senses. Of which, some high valuable important species are selected to export, such as snappers, groupers. Many trawlers operating in coastal areas, therefore, they can also capture many small pelagic fish including scads,

anchovies, sardines etc. Furthermore, shrimps, crabs, cuttlefish and squid are regularly occurred in landing of trawlers.

o *Species (and/or size/quality considerations) for reduction or animal feed*

At the moment, facing with the fact that declining in overall catch rate (CPUE), most catches are kept and landed by trawl fishermen. Accordingly, major proportion of catches used for aquaculture feed belonging to ponyfish (*Leiognathus*), threadfin porgy, lizardfish, cardinal fish (*Apogonidae*), glow belly (*Acropomatidae*), goatfish (*Mullidae*), angler (*Lophiidae*). Presently, “trashfish” consists of low commercially valuable species with small body size (<20 cm) and many high economically important species caught under commercial sizes or immature individuals, and ecologically sensitive species such as sting ray, small sharks. Trashfish can be either used as raw materials for animal feed or input materials for fish meal processing.

o *Export species*

The list of main exporting fishing products recorded by custom office of Vietnam is described in *Table 6*. In Vietnam, exported fish products are categorized into four main groups namely Mollusks, Demersal fishes, Pelagic fishes and Crustacean. Detailed species and groups are shown in the below table. Belonging to pelagic fish species, tunas includes Skipjack tuna, Yellow fin tuna, Big eye tuna are important species in terms of total exported volume and turn over. Many demersal fish species are caught for export purposes to Asian markets such as China, Taiwan, Japan...

Table 6. List of main marine captured fish species exported by Vietnam exporter.

Mollusks	Demersal fishes	Pelagic fishes	Crustacean
Octopus	Lizard fishes	Anchovies	Shrimps/prawns
Squid	Threadfin bream	Tunas	Spiny lobsters
Cuttlefish	Threadfin porgy	Mackerels	Flathead lobsters
Broad fin squid	Tongue fish	Scads	Crabs
Scallop	Goatfish	Swordfish	
Abalone	Groupers	Sailfish	
	Snappers	Sharks	
	Pike eels	Rays	
	Leather jacket fish	Common dolphin fish	
	Red big eyes		

- **General condition of coastal trawl resources**

- *Status of stocks*

In the period of 2001-2005, under the project ALMRV supported by DANIDA, a vessel equipped with bottom trawl had been used to conduct 5 surveys in the gulf of Tonkin, in the northern part of Vietnam. Of which, 4 surveys were carried out during the Southwest monsoon (SW) and the rest was done in the Northeast monsoon (NE). The demersal fish stock biomass estimated by depth strata and survey time is presented in Table 7. Fisheries resources within 20m depth reflected a high variation in biomass.

Table 7. Demersal fisheries resources (MT) estimated of the Gulf of Tonkin based on bottom trawl surveys performed during 2001 – 2005 by monsoon seasons and depth strata.

Survey time	Depth strata				Total (67,370km ²)
	<20m (13,700km ²)	20-30m (16,250km ²)	30-50m (20,640km ²)	50-100m (16,780km ²)	
SW2001	19,862	35,724	56,200	32,368	144,155
NE2001	9,106	46,822	53,072	44,043	153,043
SW2003	11,547	24,660	29,689	43,568	109,464
SW2004	28,047	34,969	70,014	48,869	181,900
SW2005	20,136	40,054	71,736	45,860	177,786

Similarly, demersal fisheries resources in the Central area have been assessed throughout two bottom trawl surveys conducted during 2004 – 2005. Decline trend in fish stocks was observed; especially in coastal water (20-30m and high fluctuation in fisheries resources in spatial and time were also recorded.

Table 8. Demersal fisheries resources (MT) estimated of the Central area of Vietnam based on bottom trawl surveys performed during 2004 – 2005 by monsoon seasons and depth strata.

Survey	Depth strata				Total (214.120km ²)
	20-30m (98.214km ²)	30-50m (2.986km ²)	50-100m (71.060km ²)	100-200m (41.860km ²)	
SW2004	140,395	3,418	120,052	115,339	379,204
SW2005	92,359	5,468	156,472	515,320	769,619

State of demersal fisheries resources in the Southeast and Southwest waters also showed high variations among survey years. Detailed information of the demersal fish stock abundance in these two areas is described in Table 8 and Table 9.

Table 9. Demersal fisheries resources (MT) estimated of the Southeast area of Vietnam based on bottom trawl surveys performed during 2004- 2005 by monsoon seasons and depth strata.

Survey	Depth strata				Total (172,620km ²)
	20-30m (24,640km ²)	30-50m (68,120km ²)	50-100m (51,950km ²)	100-200m (27,910km ²)	
SW2000	38,139	131,171	96,242	127,599	393,151
NE2000	14,041	93,775	110,111	84,408	302,336
SW2002	23,521	85,104	73,717	54,299	236,641
NE2002	35,006	98,792	94,147	101,597	329,542
NE2003	27,242	137,378	131,190	105,640	401,451
SW2004	40,598	89,685	72,949	96,520	299,752
SW2005	20,479	88,638	91,030	59,231	259,378

Table 10. Demersal fisheries resources (MT) estimated of the Southwest area of Vietnam based on bottom trawl surveys performed during 2004 – 2005 by monsoon seasons and depth strata.

Survey	Depth strata			Total (77.830km ²)
	20-30m (18.400km ²)	30-50m (31.350km ²)	50-100m (28.080km ²)	
SW2000	17,555	60,347	46,592	124,494
NE2000	22,020	71,654	53,749	147,423
SW2002	19,644	51,228	45,066	115,938
NE2002	40,586	66,309	51,478	158,373
NE2003	27,402	47,157	57,057	131,616
SW2004	25,517	37,731	38,792	102,040
SW2005	19,664	34,518	33,880	88,062

II. Scope of project

• Problem statement

Bycatch is becoming more and more problematic issue in Vietnam marine capture fishery, especially in trawl fisheries. Proportion of immature economically important species, ecologically important species in landing tend to increase therefore recruitments of fisheries resources have been negatively affected by fishing activities, particularly trawl fisheries. Additionally, demand on consumption of bycatch shows an increasing trend by aquaculture and livestock farming systems. Mostly, poor fishermen manage to keep all catch caught in order to compensate for low catch rate of economically important species. Low opportunity to seek alternative/additional incomes for almost fishermen along the coastal fishing communities leads to notable challenges for reducing fishing efforts. High fishing pressure, overfishing capacity in especially inshore waters seem to be inevitable. Requirements to have

integrated solutions to address these issues are indeed urgent needs from the government at the moment.

In addition, present fishing vessel monitoring system, fishing effort enforcement in Vietnam is not strong enough. Fisheries management regimes of Vietnam is facing with gaps and weak/inconsistent institutional. Thus legislation and strengthening the fisheries management capacity as well as awareness raising are essential and urgent needs for driving the sector toward sustainability, environmentally friendly.

- **Proposed scope of the project:**

- *Location and type(s) of fishery(ies)*

Two sites selected which are representative for the two most important trawl fishing grounds of the country namely the Southeast and Southwest are Bac Lieu and Kien Giang respectively. These provinces have dominant number of shrimp trawlers compared to the others. In many provinces, there is no clear distinguish between shrimp trawlers and fish trawlers, trawlers are nonselective target species.

- *Problems to be addressed*

In the recent years, fishing efforts in Kien Giang, Bac Lieu have been considerably climbed but shrimp resources have been dramatically declined, especially important economically species such as genus of Penaeus (tiger prawn, banana prawn, cat prawn etc). Besides, responsible fishing practices/methods are poorly introduced to local fishing communities. General characteristics of capture fisheries in these two provinces are large number of fishing boats, small-scale fisheries, and low incomes, hard to find alternative/additional incomes, high demand on fishing for local livelihoods. Management regimes/bodies are weak. Open access fishery leads to phenomenon of “race for fish”, fishermen utilize their catches.

- *Beneficiaries and stakeholders*

Through strengthening awareness of the local fishermen, regulations, assistances of the government, responsible fishing practices will be slowly adopted and complied. In the long term, inshore fisheries resources will probably be recovered. This will contribute to stable and sustainable use of fisheries resources, and to ensure livelihoods of local communities.

Regulations on introduction to and adoption of the BRDs will be issued and legislated for further spreading out in nationwide. The lessons learnt/experiences of legislation,

introduction of new fishing methods/practices, gears restrictions and promoting compliance of fishermen with fisheries managers will be distributed and shared with other provinces.

- *Justification for the choice of project scope:*

- How will it solve (part of) the stated problem

- ✓ Project will promote common understanding of responsible fishing practices in twopilot sites for all stakeholders engaged in this sector.
- ✓ Introducingbycatch reduction devices (BRDs) to through demonstrations/experiments and communication activities, showing short term and long term perspectives to fishing communities.
- ✓ Strengthening/raising the awareness of fishermen in the area on responsible fishing practices and directingfishermen's behaviors to achieve environmentally friendly, sustainable fisheries.
- ✓ Reviewing and improvement of existing management regulations and measures, strengthening thefisheries management capacity for trawl fisheries inwhole country.
- ✓ Empowering rights and responsibility of fishing associations (FAs) within fishing communities in two pilot provinces.

- *How does it relate to country priorities/national and regional policies and strategies*

- ✓ Reduction of fishing capacity in inshore waters is given priority at national level.
- ✓ Adoptions of fishing technologies/fishing practices toward sustainable aquatic resources are national priorities which are mentioned in Vietnam's fisheries law.
- ✓ The long term strategy of fisheries managementis to minimize the number of small scale fishing boats, particularly trawl fisheriesaiming to avoid/mitigate harmfulness to aquatic environment and aquatic resources.
- ✓ Article 8 of Vietnam's fisheries law also mentions that to enhance fish stocks and protect aquatic environment are duties of all stakeholders involving in the sector.

- *Representativeness – nationally and regionally*

- ✓ These pilot sites are representatives for the two most important trawling grounds in Vietnam. In the long run, bycatch especially juvenile fish exclusion devices will be applied in all trawling fleets at national scale. Performance of reduction of trashfishactivitiesis in line with Code of Conduct Responsible Fisheries issued by FAO in 1995.
- ✓ Trawl fishery is one of the most important fisheries of Vietnam capture fishery not only in terms of quantity but also in socio-economic senses.

○ *Challenges and opportunities*

- ✓ Poor understanding of responsible fishing practices is common situation in Vietnam;
- ✓ Mostly, fishermen are doing fishing for their livelihoods while having difficulties in seeking alternative job for earning additional incomes;
- ✓ Adaption of fishermen to other industries faced with challenges because of limitation in general skills and education needs;
- ✓ Presently, Vietnam has a weak fisheries management institution; weak MCS including fishing effort enforcement and mechanism as well as financial support from government;
- ✓ Lack of detailed and transparency instructions on fisheries management measures, regulations issued by fisheries managers such as MARD, DECAFIREP including 28 branches located in maritime provinces;
- ✓ Fishing communities situate along long coastline;
- ✓ Fisheries statistics is weak, inconsistent;
- ✓ Fishermen working based on their traditional experiences, existing open access fisheries;

▪ Opportunities

- ✓ Supports and compliance of fisheries managers and relevant stakeholders in all levels especially common consensus of certain number of local fishermen;
- ✓ Experiences shared with neighbor countries who involved in REBYC project;
- ✓ In collaboration with international, regional and national experts;
- ✓ Financial supports from NGO and government in ongoing years;
- ✓ Willingly to involve in fisheries management of relevant stakeholders;

SECTION 2: BASELINE DATA

○ **Description of the fishery(ies) to be part of project:**

• Description of main fleet segments

In BacLieu, mainly shrimp trawlers and nonselective species bottom trawlers occur in Dong Haidistrict (239 units). The other five districts account for a minor number of trawlers, just several tens of fishing boats (*Table 11*). According to Sub-DECAFIREP of BacLieu, these six districts make up totally 279 trawlers. This quantity is relatively small compared to number of trawlers in KienGiang province (app. 790 units). There are four districts of KienGiang which have more than 100 shrimp trawler each namely, Ha Tien, KienLuong, KienHai and RachGia. However, shrimp trawlers occur dominantly in Ha Tien, KienLuong districts and they are considered as traditional fishing gears for local fishing communities.

Generally, most fishing boats of BacLieu are equipped with small engine capacity, about 60% of quantity of trawlers having engine capacity of less than 50CV. Meanwhile, the large fishing boats, more than 50CV, are dominated in KienGiang (*Table 12*). However, trawlers target on shrimp resource are dominantly in range of 50-90CV.

Table 11. Number of trawlers by Horse Power groups and local (Districts) of BacLieu in 2010.

Rank	Districts	HP groups					Total
		20 - <50	50 - <90	90- <250	250- <400	≥ 400	
1	BacLieu township	24	1			1	26
2	HoaBinh	2					2
3	GiaRai	4	1		4		9
4	VinhLoi	1					1
5	Phuoc Long	1		1			2
6	Dong Hai	133	5	41	58	2	239
Total		165	7	42	62	3	279

Source: Sub-DECAFIREP, BacLieu, 2010.

Table 12. Number of trawlers by Horse Power groups and local (Districts) of KienGiang in 2010.

Rank	Districts	HP groups					Total
		20-50	50-90	90-250	250-400	>400	
1	An Bien		3	15	15	7	40
2	An Minh	2	2	9	6	1	20
3	ChauThanh			6	26	17	49
4	GiangRieng	2	1	1			4
5	GoQuao			2			2
6	Ha Tien	50	118	20	6		194
7	Hon Dat	5	5	35	6	5	56
8	KienHài	40	22	46	6	1	115
9	KienLuong	9	10	89	21		129
10	PhuQuoc	6		2	1		9
11	RachGia	13	16	25	72	35	161
12	TanHiep		1	4	1	2	8
Sub total		127	178	254	160	68	787

Source: Sub-DECAFIREP, KienGiang, 2010.

o Location: major fishing ports or landing sites.

BacLieu has three main fishing ports including GanhHao, Nha Mat and CaiCung. However, mostly fishing boats which target on shrimps and fishes are located in GanhHao Town, Dong Hai District.

There are some landing sites along the river which are belonged to some middlemen. Fishing ports are relatively small. Normally, fishermen transport their catches to middlemen by popular transportation means including small canoes, motorbikes, moto-boats....

KienGiang has three districts namely Ha Tien, KienLuong, PhuQuoc in which shrimp trawlers are abundant. In practically, Ha Tien is more dominated in terms of quantity of fishing boats. Fishing ports and fish markets in Ha Tien are located relatively close to the district center (downtown). The new fishing port is under construction aiming to move the present one far from center area to avoid pollution.

• Fishing grounds:

Fishing grounds of shrimp trawlers in BacLieu are normally closed to coastal areas, such as VamGanhHao (coastal area stretches from BacLieu coast to Ca Mau Coast), Nam Hon Khoai and Hon Chuoi (the Gulf of Thailand). Presently, operation area of these shrimp

trawlers is within approximately 5,000km² with the depth ranging from 7m to 40m. However, mostly small fishing boats operate in the areas of less than 10m depth. Bottom types are mainly muddy, mud – sandy.

Shrimp trawlers in KienGiang operate more widely compared to those ones in BacLieu province. Nevertheless, major fishing grounds of KienGiang trawlers are coastal areas, around small islands including HonThom, HonTre and PhuQuoc island.

o **Vessels: type and size of vessels**

In general, shrimp trawlers in both Bac Lieu and KienGiang are relatively small in sizes, mostly maximum length (L_{max}) of trawlers in Bac Lieu is ranging from 11.8m to 12.3m. Meanwhile, in KienGiang, the mean L_{max} of shrimp trawlers of 20-50CV is 11.5m and group of fishing boats of 50-90CV is 13.1m. Nearly all fishing boats of these two provinces are equipped with engines branded by Cumin, Yanmar, Hino and engine condition is fairly good. Mostly, shrimp trawlers were built in 2000 and all fishing boats are wooden hull.

o ***Fishing gears and vessel arrangements***

In KienGiang, very often one trawler has 2 to 3 gears on boat, especially fishing boats conduct fishing activities around small islands which are fairly far from coastal line. These fishing boats normally have 2-4 day fishing trip. Catches are uploaded at landed sites around small islands and/or transported to shore via transshipment boats. Survey results indicate that small trawler fishing boats normally bring only one fishing gear due to fishing operation conducted in one night. Frequently, fishermen go out about 4 to 5pm and come back in the early morning of the following day. Practically, mesh size (stretched mesh size, 2a) of the cod-end of shrimp trawlers in KienGiang fluctuate from 15mm to 25mm but average dimension is mainly around 18mm.

Market price of trawl gears in BacLieu is highly varied from 2.0 to 13.0 mill. VND and average price is approximately 5.0 mill. VND, whereas unit price of fishing gears in KienGiang varies from 2.5 to 5.0 mill. VND with average of 3.8 mill. VND.

o ***Ownership and crew structure*** (e.g. owner operated, hired crew or else)

Many small fishing boats are operated by family members/family relationship, for instances father and the sons or brothers. Number of crew working on small fishing trawlers, less than 90CV, are frequently varied from 2 to 4. Fishermen are popularly hired by boat owners, they can be paid either based on catches or fixed rate. At the moment, boat owners tend to more and more depend on labor force hired, therefore, crew can still get money from boat owners on the days fishing boats anchored at landing sites.

○ *Employment and fishing communities:*



The rough estimate of total number of trawl fishermen is about 1000 which are directly fishing. No fisherwoman working at sea on shrimp trawlers is recorded.

KienGiang has much more number of crew as well as indirect fishing labors which are involve in marketing and post harvest processing services. Number of poor fishermen's households who have small trawlers have very limited chance to invest in another industry or in earning additional income. Incomes of these families nearly all come from merely fishing activities. Accordingly, there are about 800 shrimp trawlers in KienGiang (Sub-DECAFIREP, 2010), however, in practically number of shrimp trawlers must be larger than the reported data. Rough estimation of number of local trawl fishermen is more than 3000. Thus KienGiang should be given more priority to carry out project activities.

○ Employment in postharvest activities



Due to short fishing trip, major catch are sold as “fresh commercial groups” which are preserved and kept by ice, especially small trawlers with trip duration of only one day. Larger fishing boats, >90CV, shrimp catch are boiled with salty water before uploading at shore. Women are responsible for sorting, sun drying, peeling and trading these catches.

○ Crew remuneration system

Some fishing boats are operated by family members. Mainly, labors are rent by fishing boat owners. Depending on areas, remuneration is conducted in slightly different ways. Some fishing boats do based on total trip revenue; rate of remuneration between boat owner and labor rented is normally 50:50. In some fishing communities, majorly boat owners pay labor cost with a certain rate, for instances, one fisherman get 80,000 to 120,000 VND per day.

○ **Profile of fishing community livelihood strategies:**

Fishing and fishing associated activities generate main incomes for people in fishing communities of GanhHao (BacLieu) and Ha Tien (KienGiang). Fishing operations are mostly carried out by men while women are in charge of selling catches, provisions including ices, fuels, food and relevant activities such as processing fished products including boiling, sun dries, peeling shrimp etc. Major incomes come from landings where additional income comes from women and children who involve in making new gears and repairing gears. No activity of agriculture is recorded in these fishing communities. Very few households have additional income from other services. New generations of fishing communities have better educational background therefore they might be easier adapted to new jobs while older generations have very limitation.

• Catches:

○ Catch composition



Being located in the tropics, Vietnam has very diversified species assemblages in its EEZ. Bottom trawlers may catch several tens of species in one haul. In BacLieu, the bycatch in shrimp trawlers with engine size less than 90CV accounts on average about 20% of the total catch whereas in trawlers with more than 90CV the bycatch accounts on average 25%. In KienGiang, the bycatch in trawlers with engine size less than 90 CV accounts on average at about 36%. At the present time, there is no discarded catch at sea recorded. The detailed information of catch compositions of trashfish landed by fishing fleets and sites are presented in *Table 13*; *Table 14* and *Table 15*.

The economically valuable catches of the less than 90CV shrimp trawlers in BacLieu and KienGiang are mixed shrimps which accounted for respectively 57% and 43%. This group is also dominated in catch of the above 90CV shrimp trawler fleets of BacLieu, 36%.

Table 13. Species composition in group of trashfish of ≤ 90 CV shrimp trawlers in Bac Lieu, March 2010.

Rank	Scientific names	Common names	Proportion (%)
1	<i>Engraulidae</i>	Anchovies	30
2	<i>Sciaenidae</i>	Croakers	27
3	<i>Synodontidae</i>	Lizard fishes	19
4	<i>Cynoglossidae</i>	Flatfishes	9
5	<i>Clupeidae</i>	Sardines	6
Total			90

Table 14. Species composition in group of trashfish of ≥ 90 CV shrimp trawlers in Bac Lieu, March 2010.

Rank	Scientific names	Common names	Proportion (%)
1	<i>Engraulidae</i>	Anchovies	26
2	<i>Cynoglossidae</i>	Flatfishes	19
3	<i>Clupeidae</i>	Sardines	9
4	<i>Sciaenidae</i>	Croakers	9
5	<i>Tetraodontidae</i>	Puffer fishes	7
Total			70

Table 15. Species composition in group of trashfish of ≤ 90 CV shrimp trawlers in Kien Giang, March 2010.

Rank	Scientific names	Common names	Proportion (%)
1	<i>Gobiidae</i>	Gobies	32
2	<i>Callionymidae</i>	Dragonets	9
3	<i>Cynoglossidae</i>	Flatfishes	7
4	<i>Bothidae</i>	Left eye flounders	7
5	<i>Sepiolidae</i>	Bobtail squid	6
6	<i>Mullidae</i>	Goatfishes	6
7	<i>Apogonidae</i>	Cardinal fishes	5
8	<i>Siganidae</i>	Rabbit fish	5
9	<i>Platycephalidae</i>	Flatheads	4
10	<i>Nemipteridae</i>	Threadfin breams	4
Total			85

Table 16. Proportions of catch and revenue by commercial groups of shrimp trawler fleet ≤ 90 CV in Bac Lieu, sampled data in March 2010.

Rank	Commercial groups	Catch (kg)	Catch proportion (%)	Revenue (1000 VND)	Revenue proportion (%)
1	Trashfish	360	20	1,369	5
2	Mixed fish	257	15	2,885	10
3	Crabs	8	0	1,697	5
4	Shrimps	1,152	65	23,606	80
Total		1,777	100	29,557	100

Table 17. Proportions of catch and revenue by commercial groups by shrimp trawler fleet ≥ 90 CV in Bac Lieu, sampled data in March 2010.

Rank	Commercial groups	Catch (kg)	Catch proportion (%)	Revenue (1000 VND)	Revenue proportion (%)
1	Mixed fish	20,653	26	181,569	15
2	Trashfish	20,571	26	71,122	6
3	Shrimps	28,598	36	621,214	52
4	Squids	10,711	13	314,214	26
Total		80,533	100	1,188,119	100

Table 18. Proportions of catch and revenue by commercial groups by shrimp trawler fleet ≤ 90 CV in KienGiang, sampled data in March 2010.

Rank	Commercial groups	Catch (kg)	Catch proportion (%)	Revenue (1000 VND)	Revenue proportion (%)
1	Trashfish	572	37	1,644	9
2	Mixed fish	155	10	836	5
3	Crabs	36	2	892	5
4	Squids	81	5	2,163	12
5	Shrimp	608	39	11,733	68
6	Others	100	6	100	1
Total		1,551	100	17,368	100

o Variation in catch composition by season

There are two seasons occurred in the Southeast and the Southwest areas, raining season and dry season. No considerable variation in catch composition by season of shrimp trawlers in both KienGiang and BacLieu is reported.

o Retained catches composition by species and size



There are 28 species belonging to 23 genus, 17 families which have been identified in bycatch of <90 CV shrimp trawlers sampled in BacLieu. Anchovies (Engraulidae) accounted for major proportion (30%); followed by Croakers (Sciaenidae) and Lizardfish (Synodontidae) respectively 27% and 19%. Number of fish species sampled and identified in larger fishing boats of BacLieu indicated more diversified with 49 species, 41 genus and 27 families. Anchovies and small flat fish (Cynoglossidae) are two most dominated fish families in landing of trashfish, 26 % and 19 % respectively.



Totally, 58 species belonging to 43 genus and 30 families occurring in trashfish group of <90 CV shrimp trawlers in KienGiang were identified during the baseline data survey. The three most dominated families in catch of this group are

Gobiidae (29%), (Sepiollidae)(6%) and Rabbit fish (5%).

o *Discarded catch amounts by species*



Presently, no discard was recorded by fishermen. All catches are utilized by fishermen even seastars, sea urchin etc. Good trashfish (fresh) are sorted to sale to aquaculture feeds, the rest of are used for fishmeal processing. Therefore, no trashfish, bycatch of shrimp trawlers is accordingly discarded at sea.

Few bycatch is discarded at landing sites, however, some bycatch collectors manage to utilize them for additional incomes. Some remained catch which are not be able to use for fishmeal and aquaculture are discarded at the landing sites. This can be negatively effect to natural environment especially in places which are relatively close to communities.

- ***Catch utilization and marketing:***

- Value of catch / bycatch (including trash fish)

Three main fish markets belonging to BacLieu are namely GanhHao, BacLieu township and HoPhong fish market. Accordingly, about 70% yield of trawlers is consumed by domestic market. Prices of commercial fish species for human consumption fluctuate from 15,000 – 25,000VND/kg where trashfish can be sold at 5,000 – 6,000VND/kg. Bycatches are used for fishmeal processing and feed for aquaculture in the region. Besides, some high commercially valuable fish in catches are selected to export by middlemen. There is no use of bycatch for human consumption in the province recorded.

- Details on bycatch utilization (products / value chain / end consumers)

In general, middlemen play very important roles in trading of all kinds of catches supplied by fishermen, catches and bycatches are directly bought at landing sites/fishing ports and also at sea. Catches and bycatches are normally re-sorted, washed then preserved before transporting to next market chains.

- Importance of catch / bycatch from a food security perspective

In the present context, fishermen are doing fishing operations for their demands on livelihoods. Other industries are being developed based on the policy of re-structure of national and provincial socio-economics. Thus comparing to other sectors, capture fishery is less labor attractive. This means that catch is getting more and more important to fishermen's income. Information achieved from two baseline data surveys shown an obvious situation that fishermen tend to use more and more utilizable their catches. No definition and concepts of "bycatch" are accepted by local fishermen. This is one of the main problems/challenges for adopting bycatch reduction devices to local trawlers. Furthermore, demand on consumption of landing of trawlers is increasing bycatch aquaculture in the Southwest area. This leads to have no incentive to fishermen to release small fish pieces/juvenile fish and encourage fishermen to upload all their catches. A significant numbers of fishermen interviewed refused to release amount of the present trashfish caught, however, some fishermen reflected a positive answers.

If the present situation of exploiting fisheries resources remained, recovery of fish stocks will not be sufficient to supply increasing demand on seafood of communities. And, the potential fisheries resources will be limited by over fishing capacity and ecosystem health loss. Then it would be very possible that very few fishermen existing in the sector, on other word food security for fishing communities will not meaningful in this context. Therefore, bycatch volume has minor important role in fishermen's income, however, it has strongly negative impacts to future food security.

- **Fisheries policy and regulatory framework:**
- Relevant regional/national/local fisheries and marine environment policies and strategies
(*description of relevant parts*)

✓ **In BacLieu**

The Instruction No 08/CT-UBND dated on 20 April 2006 of Provincial People Committee of Bac Lieu province regarding Strengthening the management and protection of coastal fisheries resources. The instruction emphasized on guidelines for planning and restructures fishing effort in inshore waters and banning some destructive fishing methods including push nets, pots, and set nets in the river outlet areas aiming to protect fisheries resources in inshore water. However, this instruction does not mention about shrimp trawlers, multispecies trawlers and bycatch issues.

The Instruction No 01/2009/CT-UBND dated on 08 January 2009 of Provincial People Committee of Bac Lieu provinceregarding Strengthening the environmental protection in the coastal and rive outlet areas. The instruction focused on prevents environmental population from activities of different sectors including fishing industry, transportation, aquaculture etc. No specific line for managing byctach and trawl fisheryoccurred in the paper issued.

The Decision No 2088/Q-UBND dated on 14October 2008 of Provincial People Committee of Bac Lieu regardingpromulgating Program on Protection and Development of Fishery resources of BacLieu province period 2008 – 2010 and vision to 2020.

The Decision No 666/QĐ-UBND dated on 08 April 2009 of Provincial People Committee of Bac Lieu regarding Banning on fishing operations in coastal and warp, canal areas in BacLieu province. The decision addresses that no fishing operations of trawlers, push nets, set nets, portable lift nets are allowed in the coastal areas which is in range from 3 nautical miles inward. Closed season is applied annually in the areas of less than 5 m depth in inshore waters during April to June.

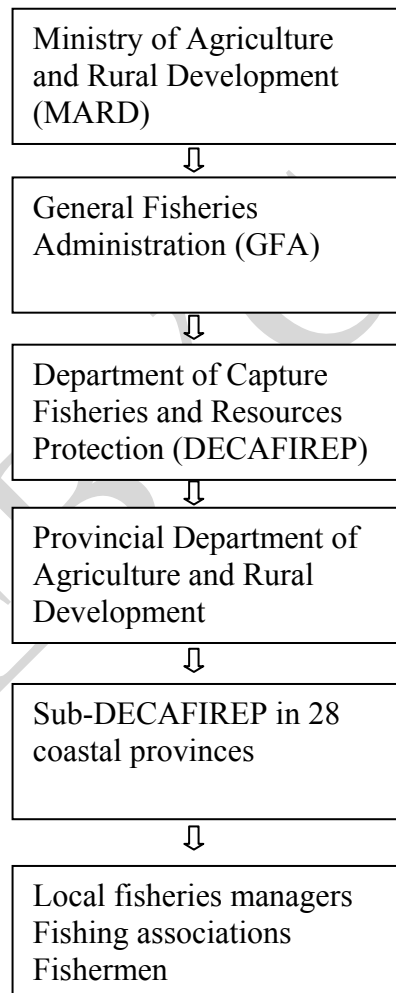
✓ **In KienGiang**

The Decision No30/2008/QĐ-UBND dated on 16 September 2008 of Provincial People Committee of KienGiang regarding promulgating Regulations on managing fishing operations and protecting fisheries resources in KienGiang waters. The regulations are to manage fishing operations in inland and marine waters; zoning and prohibited fishing gears/methods (dynamites, electric shock, cyanide), regulating on minimum allowed fish captured sizes, closed seasons and closed areas. The item 2a of the article 6 of the regulations regulates that trawlers equipped with engine power of less than 90CV are not allowed developing in quantity. Other fishing gears operating on boats equipped with engine capacity of less than 30CV are prevented from increasing in number (item 2b, article 6). Trawlers are banned in coastal areas (6 nm inward to the lowest tidal level).

Fishing boats with engine capacity in range of 20 – 90 CV are allowed to fish in areas of 6 – 24 nm (inshore waters) except high speed trawlers (item 2a, article 8).

Of both provinces, no specific regulations on managing shrimp trawlers and bycatch are issued and promulgated. Therefore, this is a big gap occurred in term of fisheries management policy.

- Relevant **regional/national/local policies and strategies on poverty** reduction and food security (description of relevant parts).
- International and regional **commitment relevant to bycatch management** and discards reduction (*description of relevant parts*).
- Relevant government institutional structure (ministries, departments, coordination arrangements)



- Review of legal definitions and terms related to bycatch and discards(not available)

Presently, there are no legal definitions and terms related to bycatch and discard existing in Vietnam fishery and management policy. Catch is always considered as catch. However, discards are commonly understood as a part of the catch which is released back to the sea during some first days of the fishing trip for large fishing boats, normally offshore fishing boats such as purse seiners.

- Legislation and regulations (e.g. executive orders, decrees etc) – current and proposed - related to trawl fishery and bycatch management(not available)

The specific regulations on managing shrimp trawlers or general trawlers and bycatch issues are not available in Vietnam at the present time. Therefore, in the frame work of this project, the regulations on management of the concern fishery, trawl fishery, will be proposed and legislated aiming to apply for trawl fishery in nationwide in the near future.

- Relevant national/local legislation with regard to decentralization of fisheries management, co-management arrangements and spatial management (e.g. fisheries refugia)

The Decree No 33/2010/NĐ-CP dated on 31st March 2010 of the government regarding the management of fishing operations conducted by Vietnamese organizations and individuals in all marine areas. The Decree focuses on zoning (demarcating) sea waters which categorized sea waters in inshore waters, from lowest tidal level line to 24 nautical miles (nm), and offshore areas from 24nm outward. The coastal areas of from 6nm inward are managed by provincial governments. This is the base for fisheries co-management implementation in all coastal provinces.

- Review of management measures applied to the concerned fleet(s) (*as defined in Scope of project above*)

The Circular No 02/2006/TT-BTS dated March 20th 2006 of MoF regarding guidelines on implementation of Decree No 59/2005/NĐ – CP dated May 4th 2005 of government on conditions for production and business of some fisheries activities. This Circular regulates that the stretched mesh sizes of cod-end for trawler fleets of less than 45CV and larger than 45 CV are required to be more than 20mm (2a=20mm) and 30 mm(2a=30mm) respectively. Closed season (annually from March to May) are suggested to apply in shrimp fishery for some important shrimp fishing grounds which spreads from the North to the South, including MiMieu, Long Chau, Ne – Ghep, Southeast Vung Tau, Cuu Long river estuary, Hon Chuoi – Ong Doc and Northwest Phu Quoc;

The Instruction No 10/2005/CT-BTS dated December 12th 2005 of Ministry of Fisheries regarding prohibition of using high speed trawlers operating in inshore waters. All large gears with high height opening and wide width opening which towed with high speed in the coastal areas within 24 nautical miles from the shore are not allowed to operate. The instructions issued to ensure that aquatic resources in these sea waters are not overexploited and to

decrease the conflicts happened among fishermen, especially between small fishing boats, artisanal fishing boats and high speed trawlers.

The Circular No02/2007/TT-BTS of Ministry of Fisheries dated July 13nd 2007, guidelines on implementing Decree No 66/2005/NĐ-CP of Vietnam government regarding ensuring the safety at sea for fishermen and fishing boats. The circular indicated mostly criteria and requirements for a fishing boats needed to meet for fishing operation at sea, for instances, fishing license, register license, rescue equipments, technical safety certification etc. However, this circular is not specific in bycatch regulations;

The Circular No 02/2006/TT-BTS of Ministry of Fisheries dated March 20th 2006 regarding guidelines on regulation of gear mesh sizes used in fishing operation for all marine capture fisheries including gillnetters, trawlers, setnets etc. The minimum mesh sizes (stretch mesh size) of the cod-end allowed for bottom trawl is ranging from 20mm (shrimp trawler boat equipped with engine of less than 45CV) to 30mm (for the shrimp trawler installed the engine of more than 45CV capacity). The trawlers of more than 150CV engine capacity allow to used the minimum mesh size of the cod-end of 40mm.

The Decree No 33/2010/NĐ-CP dated on 31st March 2010 regulated clearly that areas/fishing grounds and fishing gears operating in different zone which demarcated by this degree.

The Decree No 128/2005/NĐ-CP dated October 11th 2006 of Vietnamese government regarding illegal fishing practices. The administration sanctions were described in detailed in different cases which are considered as illegal activities related to aquatic resources protection. The amount of 500,000 to 10,000,000 VND is applied to pay if fishermen fish over the catch allowed. Punishments are also applied in cases of fishing in the close seasons and close areas, forbidden fishing gears, fishing methods (dynamics, electric shock..);

- o Licensing schemes

Presently, the government has policy to issue fishing licenses for fishing boats equipped with more than 20CV engine, for the smaller fishing boats the fishing licenses are issued by local governments. Large fishing vessels are needed to be registered by Sub-DECAFIREPs. Registration of fishing vessels is mandatory.

- o Effort control

The present MCS system of Vietnam fishery is very weak. Fisheries inspection is not strong enough to monitor the whole industry. The sector is rather to be open access situation. Government is managing to control fishing effort, however, this task demands on high efforts in terms of finance, man power etc.

- Closures (by area and by season), MPAs

Closed season and closed areas are not implemented in practically. Presently, in Vietnam, four of sixteen marine protection areas are managed under closed area. In KienGiang, one pilot MPA around PhuQuoc island (KienGiang) which was established in 2009 is deployed closed area measure. There is no MPA in Bac Lieu established.

Closed season and closed area have been mentioned in fisheries management policy in both BacLieu and KienGiang, however, they are still in “word”, on the table not in reality. Therefore, bring the policy, measures and regulation to actual fishing operations needs to have sufficient power, especially enforcement.

- Bycatch reduction measures (not available)
- Compliance with regulations

Fishermen tend to race for fish that leads to maximize their catches as much as possible. Compliance with regulations is fairly weak due to poor knowledge of fishermen and lack of incentives for them. Violative fishing practices; conflicts are frequently recorded at both two provinces.

- A review of MCS systems in place for trawl fishery including use of VMS for monitoring trawl vessels

At the present, marine capture fishery of Vietnam is in state of “open access”. The government has started to be about to implement VMS system, offshore fishing vessels are given priority to monitor firstly. In the long terms, all offshore fishing boats, more than 90CV vessels, will be monitored by VMS system. Logbooks, fishing operation reports are planned to use for all fishing vessels as mandatory.

- **Problems encountered with regard to bycatch/discards and management of concerned fleets**
- Problems encountered with respect to bycatch and discards
- Capture of juveniles

Number of juveniles of highly commercially important species including lizard fishes, croakers, threadfin breams, sardines, congers etc. and ray, small sharks occur in landings of shrimp trawlers in both Bac Lieu and KienGiang provinces. No study and estimation has been conducted for investigating volume, species and size composition of these species in trawl fisheries of Vietnam. Baseline surveys conducted in BacLieu, KienGiang in March 2010 showed diversified species of economically important species and ecologically important species encountered in landing of shrimp trawlers and general bottom trawlers.

- Interactions of coastal trawl fishery with other ecosystem components:

Shrimp trawlers operate in coastal areas and around small islands of KienGiang, BacLieu may have some negative impacts to estuary habitats and MPAs, sea grass beds. Number of spawning grounds, nursery grounds and refugia zones have been defined by research surveys done by RIMF which are close to coastal areas and overlapped with fishing grounds of small shrimp trawlers in these provinces. Nevertheless, no actual actions regarding manage fishing efforts, fishing grounds and seasons has been implemented. Study on impacts of trawlers to bottom habitats and aquatic populations are neglectful in Vietnam up to present time.

- Conflicts between different fleet segments, fisheries and other resource users

It is reported that conflicts frequently happened among shrimp trawlers and with high speed/large wing mesh size trawlers, gill netters and purse seiners. High speed trawlers frequently fish in inshore waters and target on small fish species such as sardines and anchovies. Some fishing vessels are supposed to fish in offshore waters but they do in inshore waters. Weak monitoring and enforcement lead to have more conflicts among marine resources exploiters. Overlapping fishing grounds creates more fishing capacity in inshore waters and threats to fish stocks and habitat loss in inshore waters.

- Nature of conflicts

The nature of conflict is competing fishing grounds, many fishing gears operate in the same grounds and at the same time. Overfishing, decreasing fisheries resources, overfishing capacity lead to increase conflicts between/among gears. Insufficient enforcement power is indirect allowance for existing of these conflicts.

- How the conflict is addressed

There is no specific solution from government to help fishermen solving these conflicts.

- Other problems related to fisheries management, e.g. with regard to:

- Economic and/or biological overfishing

Not available

- Fleet capacity and fishing effort

Not available

- MCS / enforcement

MCS is very weak as mentioned above.

- Importance of bycatch

- Income for fishers and postharvest handlers

Actually, no definition of bycatch is existed in Vietnam fisheries management system as well as fishing communities. Temporally, bycatch of shrimp trawlers is understood as juveniles of economically important species encountered in landing. In the present time, bycatch is also one of commercial groups of these fishing fleets. This group contributes to total income of poor fishermen that makes fishermen not willingly to exclude from their total catch.

- Demand from aquaculture

In the recent years, aquaculture has been dramatically developed in the Southern Vietnam, especially catfish farming. The increasing catfish farm productions mean demand on raw feeds for these species increased, bycatch are considered as important sources for supplying this demand. Extending catfish farm system generates a huge incentive for fishermen to keep and utilize their catch. But there is no specialized study on this issue done.

- Role of trash fish / low value fish in food fish consumption

Use bycatch of shrimp trawlers for human consumption is minor or neglected. Some low economically valuable fish species have been reported to use as input materials for value added products such as surimi and surimi like products. No scientific study on this aspect has been carried out in Vietnam.

- Other barriers to achievement of sustainable fisheries and conservation

- Destroying mangrove forests and climate changes, environmental degradation/pollutions, and existing destructive fishing methods/practices (set nets in estuary areas, push nets...) can cause very negative impacts to fishery resources and marine habitats;
- High and unstable price of fuel encourage fishermen increase fishing efforts;
- Trading system of fishing products is not stable, income lost through middlemen system also encourage fishermen fishing more;
- Poor investment of government in improvement and strengthen fisheries management institution, regulations and policy, weak enforcement;
- Poor willingness and compliance of fishermen and relevant stakeholders;
- Instable fisheries management organizations/institutions;

РЕВУС-ІІ СТІ

SECTION 3: KEY ACTIVITIES, STRUCTURES AND PERCEPTIONS

I. Activities and programs in support of bycatch management and sustainable fisheries: not available

- Description of current and planned activities
 - Government activities

Presently, National Plan of Action for managing fishing capacity is under proposed. Bycatch management and over fishing capacity in inshore water are core issues which need to address by this NPOA. REBYC 2 is expected to be pilot study and raised these issues to government. Under this project, attention of government on management of bycatch and fishing capacity will perhaps paid more interests.

- Donor funded projects and activities

Not available at the moment.

- Other activities carried out (by NGOs or other organizations)

Not available at the moment.

- Planning and implementation processes

- Which directorates are engaged in planning management measures?

Not available at the moment.

- What is the planning process for investigating and implementing management measures?

Not available at the moment.

- What level of private sector participation is being planned?

Not available at the moment.

- Earlier activities and research conducted to minimize impacts of fishing

- Reviews of bycatch and discards studies and list of references - not available

- Reviews of technologies introduced to reduce bycatch and discards

The Juvenile fish/turtles exclusion devices have been introduced by SEAFDEC. But no device is being used by fishermen due to lack of regulations, policy on management of bycatch in Vietnam's marine capture fishery.

- Reviews of bycatch postharvest utilization

There was only one survey on marine trashfish and fishmeal as aquaculture feed ingredients in Vietnam conducted in 2004 by *Edward et al.*(2004). The survey was conducted in short time period and provided insufficient data of trashfish for referential purposes.

- Reviews of success / failure with bycatch management and discard reduction measures

Not available at the moment.

- Reviews of studies of the impact of trawling on seabed habitats (not available)

Not available at the moment.

- Reviews of studies of the techno-economic impacts of changes in management measures to the commercial fleet(not available)

II. What is the relationship between fishermen and researchers / managers regarding bycatch management and reduction of discards:

- Private sector adoption of bycatch management technologies (not available)
- Private sector participation in bycatch projects (not available)
- Private sector perspective of bycatch management and discard reduction (not available)
- Public awareness of bycatch management and discard reduction(not available)

III. Market drivers:(not available)

- Market / value-chain structure for catch and bycatch products from the concerned trawl fleet(s) (processors, traders, companies, domestic and export markets)
- Existing eco-labeling and or certification schemes (not available)
- For marine products – domestic or export markets (not available)
- For other food products – domestic or export markets (not available)
- Existing or likely future price premiums for “eco-friendly” products
- Domestic consumers’ perception of “eco-friendly” products (awareness of the concept)

SECTION 4: PROJECT FORMULATION

I. What is the expected impact of the project?

- On fish catches

Important objectives of the project are to improve the long term catch quantity and catch quality, wide adoption of BRDs by trawl fishing community. These achievements are expected based on the assumption that adoption of BRDs will generate chances to juvenile fishes to grow up and reducing ecological important species. The more juvenile fish's survivor rate implies the better recruitment of fish stocks which ensure to positive changes in fish abundance and value of catch landed by trawlers will be improved.

- On discards

Presently, no discard by trawler fishing fleets is reported. Through strengthening the fishing habits/practices of trawl fishermen toward responsible fisheries might ensure that discard will be mitigated in future when fish stocks are recovered. And, compliance with use of BRDs is an important measure to ensure no discard mitigated in the future.

- On fishing capacity, employment and income of fishers in the concerned fleet segment(s)

In the long term, recovery of fish stocks due to increasing in potential recruitments of juveniles and small fish escaped from BRDs. Theoretically, abundance of fisheries resources will probably improve quality landing. Therefore, incomes/livelihoods of fishermen will be possibly stabilized/ sustained and improved. These conditions will perhaps lead to decrease fishing pressure on coastal fishery resources. In case fisheries management measures are strictly applied such as closed season, closed area and relevant input controls, fishing effort will be decreased.

Cut down number of present fishing boats is infeasible for the reason that large numbers of fishermen need job and livelihoods. Reduction of fishing capacity by improve selective fishing gears, closed season and closed area are fairly good approach to reduce fishing capacity and enhance fisheries resources in coastal areas. However, government needs to have good and long term plan as well as short term support for poor fishermen to guarantee their livelihoods.

- On post-harvest sector

In theory, fishermen have better catch volumes with higher values, annual catches will be probably stabilized or sustainable even higher volumes of fish will be obtained. Besides increasing catch values will lead to have more labors engaged in post-harvest processing

or/and fisheries trading. It is possible that increasing in catch values and volumes will generate more jobs for communities.

- Fish (bycatch) consumption

Presently, in some small parts of bycatch can be utilized for human consumption. But in the future, if adoption of BRDs success bycatch will be reduced. In addition, better landing will be obtained then consumption of bycatch will be no longer happened.

- Inputs into other economic activities (aquaculture)

Aquaculture will decrease amount of bycatch demand. It is expected that aquaculture will not used a large volume of small juvenile fish. Input for fish meal processing and aquaculture feed will be byproducts of processing plants.

- Conflicts (between resource users and/or other stakeholders)

Number of spawning areas and nursery grounds, fisheries refugia of offshore fish species situate in inshore waters where trawlers operating. Reduction in catching juvenile pieces of fishes will enhance number of fish populations to rehabilitate. Offshore fish stocks will probably be more abundance and the marine food web will be consequently improved. This might ensure that offshore fish stocks to recruit and potential catch of offshore fishing boats are guaranteed. Overlapping fishing grounds, conflicts will be possibly decreased.

- Relevant marine habitats

Marine food webs have been seriously damaged by fishing activities worldwide. Reducing in catching juveniles and small fish (low commercially valuable fish species) will positively affect marine ecosystems in terms of food chains and food webs. Available preys are important food sources supply for higher trophic level species (predators). Decreasing in number of fishing efforts through adopting closed seasons and closed areas will benefit for marine habitat in terms of protecting seabed and demersal marine creature populations, niches etc from swept activities of bottom trawls.

- Legal and institutional structures – government, private sector, social society

Project will strengthen fisheries management for trawl fishery in the local areas through involving more stakeholders engaged and improve awareness as well as responsibilities of direct and indirect resource users to share rights and responsibilities. Regulations on trawlers and bycatch management will be legislated and communicated/introduced to fishing communities in nationwide. And, principles, studies learn will be base for managing all trawl fisheries in the whole country.

- Regional cooperation on bycatch management

In collaboration with neighbor countries which involve in REBYC 1 and REBYC 2, experiences in managing trawl fishery and bycatch issues will be exchanged. International Cooperation Department of the Ministry of Agriculture and Rural Development (MARD), General Fisheries Administration (GFA) will be major counterparts which are in charge organisms to take place this role. Technical and management measures for addressing bycatch issues will be key contents for member countries to share experiences in.

- Awareness raising

Key measures for success of this project are to improve awareness of fishing communities in responsible fishing practices and fishing behaviors as well as possible trawlers impacts to marine seabed and demersal fisheries resources, habitats. Communicational activities and training workshops, meetings will be useful to direct fishermen's behaviors toward sustainable fisheries.

II. Who are the beneficiaries and stakeholders?

- Direct and indirect beneficiaries

Successful results of the project will directly benefit fishermen who are fisheries resources exploiters. In the short term, landing can be lessened but in the long term catches will be recovered and better quality for instances, larger sizes, and higher market values. Fishermen, post harvest processing are also direct beneficiaries. Higher catch volumes and market prices will benefit for government in term of export turnover and GDP contribution. Fish stocks recovered, better quality and more abundant will ensure the sustainable fisheries resources or seafood supply which provide consumers more chances and choices for their preferences/utilities.

- Stakeholder analysis

Governmental fisheries managers	Responsibilities
General Fisheries Administration (GFA)	Project General management
Department of Capture Fisheries and Resources Protection (DECAFIREP)	In charge organism
Department of Sciences, Technology and International Cooperation (GFA)	Assistance in regional and international cooperation/ relevant experiences and studies exchanges
Department Legislation, Ministry of Agriculture and Rural Development (MARD)	Legislating regulations for bycatch and trawl fisheries
Local fisheries managers	
Provincial People Committee (PPC)	Facilitate project activities, generate local measures/regulations for managing bycatch, trawl fishery of the province
Department of Agriculture and Rural	Facilitate project activities, generate local

Development (DARD)	measures/regulations for managing bycatch, trawl fishery of the pilot sites
Sub-DECAFIREP	Facilitate project leader team and involving in implementing project activities (landing samples, observation programme, BRDs demonstrations, awareness raising activities, licensing)
Research Institutions	
Research Institute for Marine Fisheries (RIMF)	Demonstrations of Exclusion Devices Studies on catch and species compositions/size compositions Fuel consumption and fishing efficiency
Fishing communities	
Fishing Associations	Involving in spread out experiences learnt in BRDs; post harvest preservation and processing; regulations on fishing activities and bycatch measures..
Fishermen	Involving in BRDs demonstrations; experiences learnt and shared with other communities in adoption and compliance of BRDS and regulations, measures etc.
Middlemen	Involving in value chains of fishing products especially on bycatch trading; output controls will be preliminarily introduced to apply to this industry.

III. What are the expected outcomes?

- ✓ Better management for bycatch of trawl fisheries in Vietnam;
- ✓ Regulations and measures on managing trawl fishery and bycatch issues will be legislated;
- ✓ Fishery resources in the coastal areas will be recovered;
- ✓ Awareness of fishing communities will be positively raised;

IV. What are the outputs?

- ✓ Selection of suitable BRDs applied for different fishing gears and areas;
- ✓ Demonstrations and evaluation of BRDs in comparison with control fishing boats in fuel consumption and fishing efficiency;
- ✓ Strengthening the awareness raising for fishing communities in responsible fishing practices and fishery resource restoration/rehabilitation;
- ✓ Regulations and management measures for managing bycatch and trawler fisheries;

- ✓ Over views of shrimp trawl fishery in both BacLieu and KienGiang provinces during project life;
- ✓ Scientific papers published in national journals.

V. What are the main activities?

- ✓ Experiments of BRDs

In each pilot site, three (03) demonstrations of BRDs will be performed in the first year aiming to select suitable devices for each fishing fleet and area. The selections conducted is on the basis of experiences and results on socio-economic studies (fuel consumption, costs and revenues of fishing boats using BRDs, fishermen's behaviors etc.), catches and bycatches, species composition and catch composition. These experiments will be conducted in collaboration with local fishermen, RIMF, DECAFIREP and Sub-DECAFIREP.

- ✓ Producing BRDs

After selection of suitable BRDs completed, these selective types of BRDs will be produced based on number of fishermen committed to trial during project life (4 years). Quantity of BRDs made will be available for given fishermen in two pilot areas.

- ✓ Sea trials

Introduction of BRDs and project objectives as well as priorities to fishermen is first step to get compliance from communities. Given number of fishermen, totally 20 fishermen, 10 fishermen each province, who are willingly to involve in demonstrations will be committed with project team with witness by Sub-DECAFIREP and/or local governments.

The deal will be made with committed fishermen to compensate for income lost by BRDs and they must be ensured/agreed that enumerators/project partners will be freely to access fishing boats or do randomly observation programme, landing data.

- ✓ Landing data collection

Under project framework, landing data collection will be taken place for estimating catches, species compositions, catch compositions, catch rate (CPUE), fishing grounds and related socio-economic information. Landing survey will be monthly done with random samples for assessment and evaluation of the shrimp fisheries in the areas. This data source will help to cross-check logbook data and observation programme.

- ✓ Observation programme

Observation programme will be randomly implemented on BRDs committing fishing boats. Contracts signed between fishermen and project leader have to clearly indicate responsibilities and rights of each side. Basically, enumerators rents; project staffs, sub-DECAFIREP or local fisheries managers have right to observer on boat to gather information needed.

- ✓ Review existing management regulations and propose regulations needed to legislate

Transparent regulations on management of shrimp trawl fishery are important guidelines on regulating the sector toward long term objectives. One of expectations of the project is to formulate specific regulations/measures on managing shrimp trawlers with emphasize on bycatch issues.

Regulations/measures on managing fisheries in each province will be consulted in two levels, government regulations for areas from 6nm outward and for specific regulations/measures for areas managed by local province, 6nm inward.

- ✓ Study value chains

Value chains of bycatch and catch of shrimp trawl fishery in two pilot provinces will be studied in order to seek for question on how to get better benefit for fishermen if the trading system changed. And who get the most benefit in the present market system?

- ✓ Midterm review workshops

Midterm reviews workshops are planned to annually hold to evaluate activities/components have been being conducted/finished aiming to adjust in time for ongoing stages. The workshops should focus on results achieved and finding out difficulties/challenges as well as respective solutions for each problem. Plan/schedule should be also updated and/or revised to match project's expectations.

VI. Monitoring and evaluation – what would be good SMART indicators?

Activities	Specific	Measurable	Achievable	Relevant	Time bound
Demonstration of BRDs	Selection of BRDs	<ul style="list-style-type: none"> • Number of BRDs selected • Technical reports on use of BRDs 			2011
Producing BRDs		<ul style="list-style-type: none"> • 360 BRDs for two provinces 			2011-2014
Monitoring and evaluation	Landing data Fisheries economics information	<ul style="list-style-type: none"> • Number of surveys completed • Reports composed • Number of evaluations/assessment reports 			2011-2014
Observation programme	Observer on boat using BRDs	<ul style="list-style-type: none"> • Reports on fishing operations and 			2011-2014

		catch/revenues/co sts data			
Awareness raising	Communication and training/workshops	<ul style="list-style-type: none"> • Numbers of training/meeting/workshop • Number of leaflets/posters/video issued/published • Number of fishermen participated 			2011- 2014
Regulations and Legislation		<ul style="list-style-type: none"> • Regulations legislated and implemented, complied by fishermen 			2012- 2014

VII. What are the implementation and management arrangements?

- Consultations and collaboration arrangement with private sector and stakeholders

National consultants are invited from fisheries research institutes and working under the contracts signed with project manager/project in charge organism. The appropriate candidates basically will work on short time period contracts and have long experience in fisheries management especially familiarly to the two pilot provinces are given better priority. National consultants in fisheries socio-economics, fishing technology and fisheries management are highly considered.

Fishermen are encouraged to contribute time and mean of demonstrations conducted and provide fishing operation information. A certain number of trawl fishermen will be invited to involve in project activities. Local governments including Provincial People Committee (PPC), Division of Agriculture and Rural Developments, fisheries managers in pilot fishing communities assist to arrange contracts and commitments between fishermen and project manager.

- National project management arrangements

At the national level, project proposal will be submitted to the Ministry of Agriculture and Rural Development (MARD), the Ministry of Planning and Investment to get approval and require for co-financing. DECAFIREP will arrange office and instruments, official documents to complete official procedures needed for project to ensure project run smoothly. DECAFIREP will be in charge organism which directly drive/control project toward expected outputs and objectives. The department will be responsible for assisting to contact with Sub-DECAFIREP, Division of Agriculture and Rural Developments in KienGiang, BacLieu province, and local governments aiming to officially get all relevant stakeholders participate in project activities.

VIII. Risks:

- What are the main risks for not achieving the outputs and outcomes?
 - Fishermen refuse to cooperate with Project staffs;
 - Many other trawlers operating in the same fishing ground using no BRDs
 - Local fisheries enforcement is not strong enough to manage trawlers from other provinces lead to negative behaviors of pilot site fishermen;
 - Fishermen do not follow strictly commitments signed with project manager;
 - Legislation is time demand;
 - Difficult to apply BRDs on large number of trawlers;
 - High demand on livelihoods of large number of poor fishermen;
- Are there potential undesirable effects?
 - Conflicts/reaction of shrimp trawl fishermen, other trawlers do not use BRDs in the project life;

IX. Project budget: *see also attached sample spread sheet*

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ANNEXES (including but not limited to):

- Catch statistics (volumes and values) and effort data for concerned trawl fishery(ies)
- Additional socio-economic data and studies of trawl fishery (catch values, income, employment, catch utilization, trade, consumption, etc)
- Maps of fishing grounds, seabed habitats and major fishing ports
- Diagrams of bycatch reduction devices used in the fishery
- Diagrams of fishing gears and arrangements used in the fishery
- Photos of vessels and fishing gear used in trawl fisheries
- Copies of **current** fisheries legislation and policy documents as described under *Fisheries policy and regulatory framework* in Section 2 above.

REBYC-II CFI