

INDONESIA

**NATIONAL REPORT ON
BYCATCH MANAGEMENT AND REDUCTION OF DISCARD**

REBYC-11 CFI

JAKARTA, MAY 2010

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SECTION 1: OVERVIEW AND SCOPE OF PROJECT

1.1. National overview of trawl fisheries

Among several types of trawl gears, bottom trawl is the most common operated in the Indonesian water targeting both shrimps and demersal fishes. Other types of trawl is fish trawl net that normally operated in the water column. Several types of fish net trawl locally named as arad, dogol (danish seine), and cantrang initially more operated in the water column targeting fish. Nowadays the otter board of these trawls have been modified in order to be able to operate them close to the seabed, similarly with the bottom trawls.

Bottom trawl is operated on the seabed in order to effectively catch shrimps and demersal fishes. Trawling is usually conducted in the shallow water within depth range of 10-60 m. Even though not legal, sometimes bottom trawls are also operated in the estuarines close to the river mouths. These areas are relatively shallow and rich in nutrients making them important feeding grounds for Penaeid shrimps. With flat topography and substrate types of sand, mud and sandy crust, these grounds are suitable for bottom trawl operation. Therefore, penaeid shrimps are caught by the shrimp trawler in these shallow water areas. Some shrimps trawlers also choose the mangrove zones as their fishing ground. Mangrove zone has a high productivity and is a feeding and nursery ground for certain shrimps and demersal fishes.

As the Presidential decree No. 39 (Keppres No. 39 Tahun 1980) was issued, the legal operation of trawl or trawl-like fishing gears in the Indonesian water was prohibited (banned). Direct impact of this ban was a significant decrease of national shrimp production. To overcome this impact, the presidential decree No. 85 (Keppres No. 85 Tahun 1982) was issued and legally allowed the operation of shrimps trawls equipped with a BED (*Bycatch Excluder Device*) in certain waters in Kei Islands, Tanimbar, Aru, Papua and Arufura sea, from 130° to the eastward, excluding the coastline of the islands boundary by the 10m isobath. Since the shrimps resources in these areas are considerably good and have not yet been utilized by the traditional fishermen, shrimp trawling is now allowed. The shrimps trawl operations in these areas are not predicted to ignite a conflict on competing of fishing ground among traditional fishermen.

In 1980 the Ministry of Agriculture issued a ministerial decree No: 694/Kpts/Um/1980 on the limitation of fishing ground for trawl net. This ministerial decree banned on trawl net operation surrounding the waters of Java and Sumatera Island. In order to utilize fish resources within EEZ of Indonesia the ministerial Agriculture decree (SK. Mentan) No: 770/Kpts/IK.120/10/1996 was issued and regulated the operation of fish trawl in the Indian ocean EEZ of West Sumatera and Aceh. The operation of fish trawl are allowed to target fish only in the water column; in practice however, the gears have been modified to be able to fish close to the seabed targeting demersal fish and are often deployed within

territorial waters. This practice has caused the fishing grounds among the fish trawlers and local traditional fishermen to overlap.

A worst condition occur particularly on the boundary areas where many trawlers have been operated by the fishermen from the neighbouring country. This make an issuance of marine and fisheries ministrial decree No. 06/Men/2008 Regarding on Trawl net operation in the northern part of East Kalimantan (*Penggunaan Alat Penangkapan Ikan Pukat Hela di Perairan Kalimantan Timur Bagian Utara*). Terminology of “pukat hela” is similar with “trawl net” .

The regulation of fishing ground for “pukat hela”/trawl net is as below:

- **Zone I** is an area with coverage from 1 nm to 4 nm from the coastline where it is permissable for the trawler operation with size up to 5 GT
- **Zone II** is an area with coverage of 4 nm to 12 nm from the coastline where it is allowable for the trawler operation with size up to 30 GT

The distribution of trawl and trawl-like gears in the Indonesian water is presented in Figure 1 .



Figure 1. Distribution of trawl and trawl like fishing gears in Indonesian waters (Anon. 2005).

According to the national capture fisheries statistics, each fisheries management area has different number of trawlers (Table 1).

Table 1. The number of unit of trawl according to the types and coastal areas in 2008

Coastal Areas	Type of trawler (Units)		
	Double rigs shrimp trawl	Stern shrimp trawl	Fish trawl
West Sumatera	715	650	372
South Java			6
Malacca strait		252	223
East Sumatera	392	2614	554
North Java	131		1668
Bali Nusatenggara			
South/west Kalimantan	157	563	691
East Kalimantan	412		277
South Sulawesi	465	293	724
North Sulawesi	55	6	7445
Maluku-Papua	418	21	454
Total	2745	4399	12414

Sources: Capture Fisheries Statistic of Indonesia 2008

The total number of trawl and trawl-like gear/vessel in Indonesian marine water is 19,558 units. A breakdown of this gives 2,745 units of double rigs shrimp trawl, 4,399 units of stern shrimp trawl and 12,414 units of fish trawl (Table 1). There are two types of bottom trawl targeting shrimps as a main target that is double rigs shrimp trawl and stern shrimp trawl. Both of these shrimps trawls have caught fishes and other marine biotas as by-catch while fish trawl targeting fishes as main target catch also produce shrimps as by-catch.

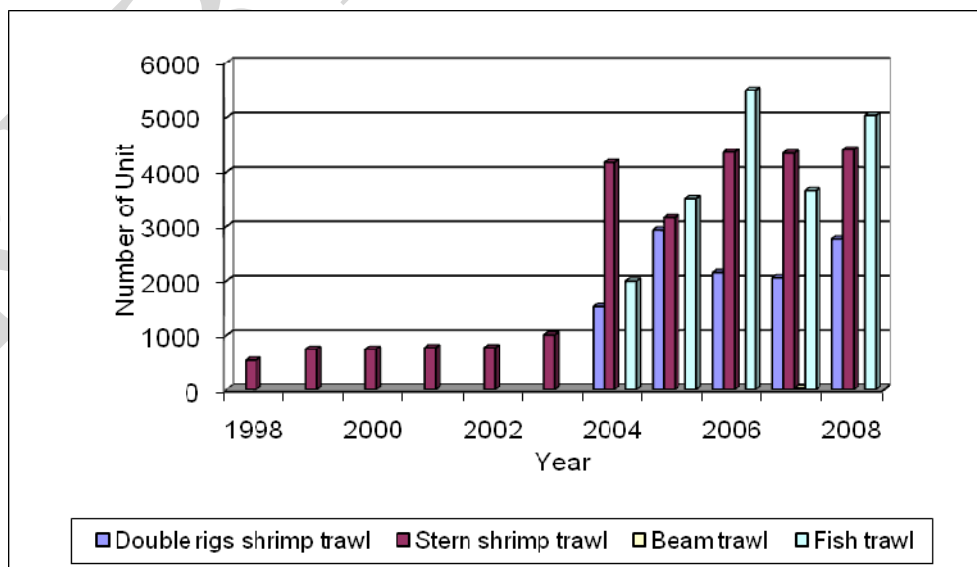


Figure 2. Number of trawl in Indonesian waters based on type of trawl, 1998-2008

The number of trawl units operated in Indonesian water increased significantly in 2004. The number of active stern shrimp trawlers in 1998-2003 was less than 1,000 units, but in 2004 there has been recorded more than 4,000 units. The dramatically increase of the number of stern shrimps trawl In 2004 was due to opening of new fishing ground for trawler particularly in the ZEEI zone. In 2007 there were even recorded for the operation of 21 beam trawlers but no continuation for the following year. There are also indicated that each type of trawl has a fishing trip variation among the coastal areas as presented in Table 2.

Table 2. The number of fishing trip of trawlers by trawl types and coastal areas in 2008

Coastal Areas	Number of trip		
	Double rigs shrimp trawl	Stern shrimp trawl	Fish trawl
West Sumatera	16120	38169	1122
South Java			
Malacca strait		64020	7285
East Sumatera	7512	2866	91287
North Java			122835
Bali Nusatenggara			
South/west Kalimantan	2355	36518	108610
East Kalimantan	61800		37395
South Sulawesi	3020	4267	146300
North Sulawesi	3837	1056	10063
Maluku-Papua	3892	272	13368
Total	98536	147168	538265

Sources: Capture Fisheries Statistic of Indonesia 2008

In terms of the number of fishing trip, in 2008 fish trawlers become the most frequent fleet with activities up to 538,265 trips, followed by stern shrimp trawl with 147,168 trips and double rig trawl for 98,536 trips, respectively. The total catch of those trawlers also vary for different coastal areas (Table 3).

Table 3. Total catch of trawl by type of trawl and coastal areas in 2008

Coastal Areas	Total Catch (tons)		
	Double rigs shrimp trawl	Stern shrimp trawl	Fish trawl
West Sumatera	1236	581	2468
South Java			
Malacca strait		3301	101
East Sumatera	3113	864	2856
North Java			6979
Bali Nusatenggara			
South/west Kalimantan	675	9874	655
East Kalimantan	437		796
South Sulawesi	1962	669	3691
North Sulawesi	33	175	272
Maluku-Papua	19455	981	195701
Total	26911	16445	213519

Sources: Capture Fisheries Statistic of Indonesia 2008

In 2008 the total catch from the trawlers recorded was the following: fish trawl 213,519 tons, double rigs shrimp trawl 26,911 tons, and stern trawl 16,445 tons. The historical of total catch by each trawl types from 1998 to 2008 is presented in the Figure 3.

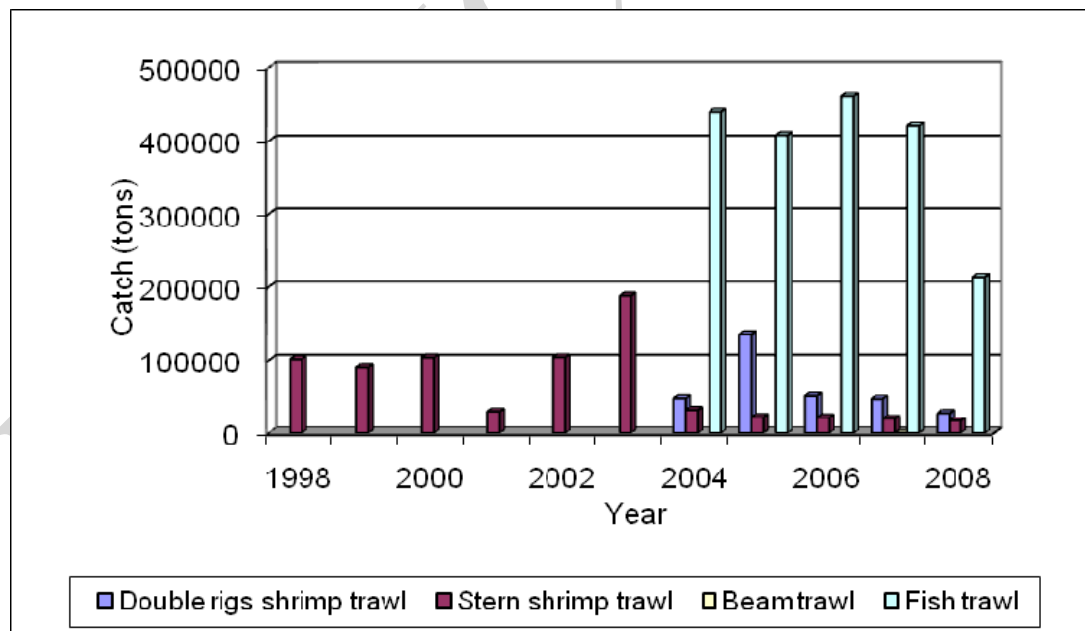


Figure 3. Total catch of trawl net in Indonesian waters based on type of trawl, 1998-2008

The catch from different types of trawler in Figure 3 representing total catch of both fish and shrimp for each years. From 2004 the total catch has dominated by fish trawler compared to other trawler types. The catch ratio or comparison of shrimps and fish from

specific gears such as trawl could not be afforded from the national fisheries statistic report. The catch ratio could be estimated using the data from subsequent result of research in Arafuru sea of as presented in Table 4.

Table 4. Bycatch ratio to shrimps by sub areas caught by shrimp trawler in the waters of Arafura.

Year	Sub area in Arafura Sea 1)	Ratio bycatch to shrimp	Sources
1992	II Bintuni	9:1	Iskandar <i>et al.</i> (1993)
1993	II Bintuni	5:1	Badrudin & Karyana (1993)
1993	III Kaimana	4:1	Badrudin & Karyana (1993)
1995	III Kaimana	5:1	Nasution (1997)
1996	III Kaimana	9:1	Widodo (1997)
1997	III Kaimana	8:1	Suharyanto (1997)
1998	III Kaimana	8:1	Sumiono et al (1998)
2001	III Kaimana	5:1	anonymous
2002	III Kaimana	6:1	Budihardjo & Budiman (2002)
1982	IV Dolak	18:1	Sumiono (1982)
1982	IV Dolak	19:1	Naamin & Sumiono (1983)
1985	IV Dolak	21:1	Rusmadji & Soselisa (1985)
1993	IV Dolak	12:1	Badrudin & Karyana (1993)
1982	VI Aru	11:1	Sumiono (1982)
1991	VI Aru	13:1	Widodo (1991)
1993	VI Aru	12:1	Widodo (1997)
1996	VI Aru	8:1	Widodo (1997)
1997	VI Aru	11:1	Suharyanto (1997)
1998	VI Aru	13:1	Sumiono <i>et al</i> (1998)
2001	VI Aru	12:1	Sumiono dan Wiadyana (2001)

1) Indicated in Figure 4.

Table 4 indicates that the ratio of shrimp and bycatch in from shrimp trawlers in Arafura is about 1:4 to 1:19. The differences of the catch ratio of shrimps and bycatch-fish among those studies might be due to those studies were conducted at different time and fishing ground in the Arafura sea. In general, there are a decreasing proportion of shrimps

catch in recent years thus the bycatch proportion become higher. The division of fishing ground in Arafura sea is presented in Figure 4.

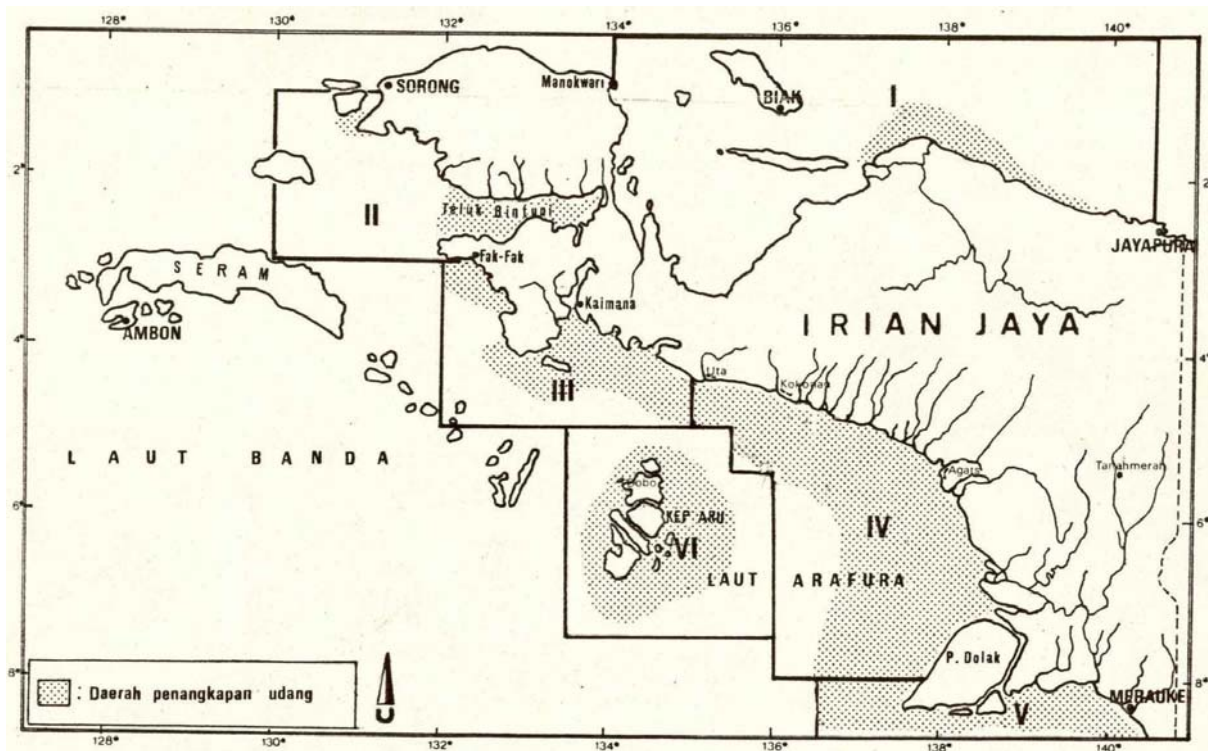


Figure 4. Map showing the location for research on ratio of trawler shrimp bycatch in Arafura Sea.

The information of proportion on shrimp and bycatch fish from research activity in arafura sea could be used as an estimation reference to predict the bycatch of shrimps trawler throughout the Indonesian marine waters. Difference situation with shrimps trawl, the proportion of bycatch shrimp from the operation of fish trawler was much smaller that is around 2-5 % from the total catch (Sumiono and Wiadyana, 2001).

The total catch of shrimps from Indonesian waters since 1998 to 2008 relatively stable for 200,000-250,000 ton/year. There are several shrimps species commonly caught from Indonesian waters reported in national that is endeavour shrimp, white shrimp, rainbow shrimp, king prawn shrimp, dan tiger shrimp.

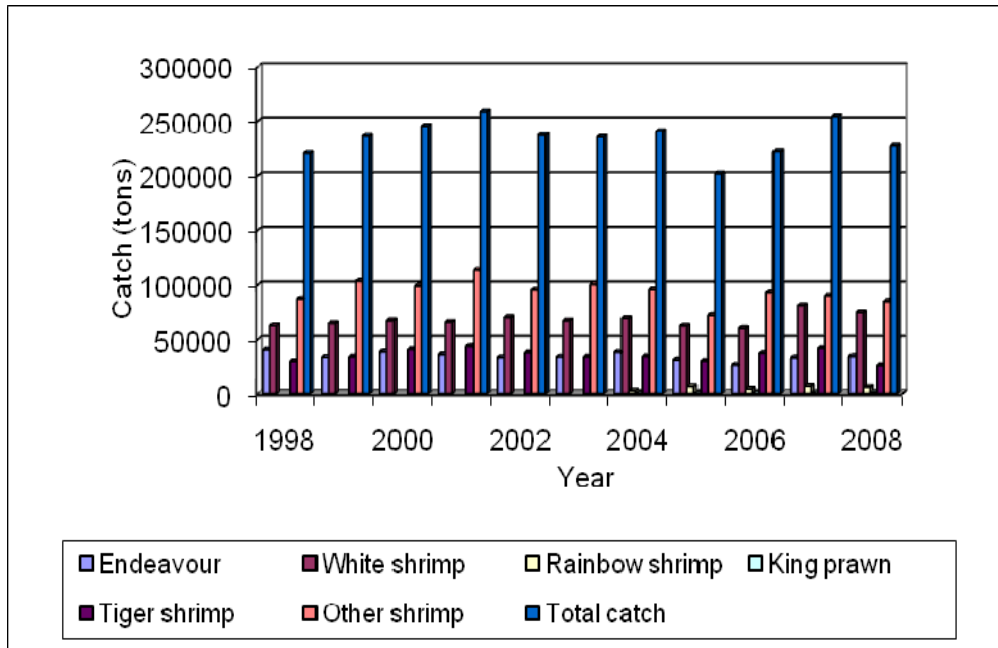


Figure 5. Annual production of shrimps by species from 1998-2008

The total shrimp catch in 1998 - 2005 fluctuated from 200,000 – 250,000 tons. The lowest production occurred in 2005 (200,000 tons). The highest production is contributed by other shrimp (*krosok shrimps* or miscellenous agregated small shrimps) followed by white shrimps, tiger shrimps and endeavor shrimps while king prawn and rainbow shrimps contributed a minor production among other shrimps.

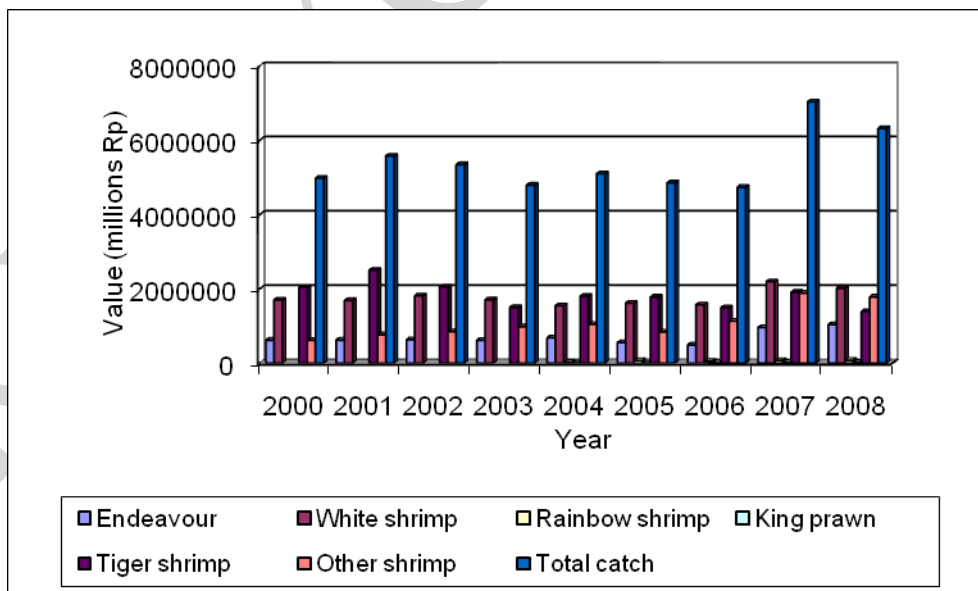


Figure 6. Annual economic value of shrimps production by species from 1998-2008

Total value from shrimp production has been relatively stable for IDR 4,5 trillions (USD 450 millions) but increased significantly in 2007 to about IDR 6,5 trillions. In 2008 the

value was just above IDR 6 trillions. Tiger shrimps and white shrimps among others gave major contribution to the total value annually. "Other shrimp" has a highest total catch compared to other shrimps but a lower economic value particularly in the year of 2000 – 2006. However, since 2007 – 2008 the value of other shrimps increased and contributed to the total value from the shrimps production eventhough the total catch of this shrimps remained stable compared to the subsequent years.

1.2. Scope of project

The issue of bycatch and discards in the trawl fisheries involving small-scale boats is significantly different from the trawl fisheries conducted by industrial fishing companies. Shrimp is the most expected catch among small-scale trawl fishermen and the bycatch is dominated by groundfish, such as members of Leiognathidae, Haemulidae, Mullidae, and Scianidae. The bycatch can be sold by fishermen to buyers who will either resale it or process it into dried or salted fish or became fish meal.

Since not all bycatch are kept onboard (by fishermen), the rest will be returned to the sea as discards. It is well demonstrated that in trawl fisheries targeting shrimps, the proportion of bycatch far exceeds the proportion of the shrimps. Therefore, discards has become one of big issues in the trawl fisheries, especially the one that is conducted by fishing companies operating large sized trawlers. This situation is particularly applicable to the trawl fisheries at Sorong.

In some regions, the small-scale fishermen may have no specific target species because the populations of those species are at a low level. To them, any catch is valuable and worth to be retained. Therefore, discards is not an important issue. Fishermen now consider the catch of earlier target species merely as a bonus because they do not expect to catch them anymore. This situation is likely observed in the northern Java trawl fisheries (Cirebon, Tegal and Brondong) and Bengkulu (Sumatera).

In other regions, small-scale fishermen are more confident with successful trawling since their main target species are still abundant. To them, shrimp is often the most valuable catch while certain type of fish are interesting to them only to be kept for family's meal (e.g. Indian mackerels) or to be distributed in their neighborhood. However, by-catch is not an issue since most of those fish are sold to local fish processors. The fishing intensity conducted by the small scale fisheries is not as intensive as that carried out by industrial trawlers. The issue of potential discards is less relevant than the discards resulted from the operation of the industrial trawlers. This situation is commonly found in the trawl fisheries in Tarakan, Kotabaru and Pontianak.

While the trawl fisheries mentioned above are concentrated to catch shrimps, the trawl fisheries in Belawan are targeting various types of demersal fish. The fish trawls consequently produce less by-catch since their catch is dominated by their targets which are multi-species of finfish. Certainly if they accidentally catch some shrimps, they will retain

the by-catch on-board. Fishermen are likely concerned when the catch is dominated by small-sized fish individuals of no market value.

The three types of potential strategies to manage the by-catch issues are: (1) adjusting trawl operations according to natural spatial and temporal distribution of the target species and its associated fish assemblages, (2) improvement of fishing methods to reduce the likelihood of unwanted fish retained by fishing gear or improvement of fishing selectivity, and (3) directing fish transaction to certain quality of fish that promote protection of young or small fish from early exploitation.

SECTION 2: BASELINE DATA

2. 1. Description of the trawl fisheries in Arafura sea

As mentioned in the section 1, trawl fisheries are legally permitted to operate in Arafura Sea and Makassar strait waters so that the next project activities will be focused on those two fishing areas. In Arafura Sea there are two type of trawl fisheries, namely shrimp trawl fishery and fish trawl fishery, while in Makassar Strait there is mostly shrimp trawl fishery. Fish trawling is conducted in deeper water (>60 m) and the main target catch is fish, while shrimp trawling is usually conducted in shallow water (30-60 m) and shrimp is the main target species. There are three fish landing sites for loading the catch of those trawlers operating in Arafura Sea; these are Fishing Port of Tual, Fishing Port of Ambon and Sorong Fish Landing Place. Shrimp trawlers in Makassar Strait usually land the fish in Tarakan Fishing Port.

The exploitation of shrimp resources in the Arafura Sea began in 1967 with an 'exploratory survey' programme by a number of companies involved in an Indonesia-Japanese partnership with Indonesian-Japanese joint ventures based in Ambon and Sorong. This fishery developed so fast that the government was forced to create a legal framework with specific rules and regulations. Furthermore, in 1967 the Government promulgated Law No. 1 of the year 1967 concerning Foreign Investment which was followed a year later by Law No. 6 of the year 1968 concerning Domestic Investment, which was further amended in 1970 to become Law No. 12 of the year 1970. Under this legal framework, through the facilities provided by Foreign and Domestic Investors as well as bilateral and multilateral loans, a total of 26 domestic fishing companies were established. By 1976 the shrimp trawling fleet in the Arafura Sea had reached 120 vessels of 100-350 GT tonnage. The vessels were double rig shrimp trawlers of approximately 35-45 m LOA, 5-7 m B, and 3-4 m D. The trawls had a 40 mm mesh size codends. At this time, almost all licensed companies in the fisheries sector were involved in the capture and processing of wild-caught shrimp, and the Arafura Sea had become one of the main shrimp fishing grounds in Indonesia. The

success of these joint ventures encouraged a swift expansion of the shrimp fishery in the Arafura Sea.

In 1971 the total number of shrimp trawlers recorded was only 17 fishing vessels which operated not only by the joint venture companies but also by the national-owned companies. Total number of shrimp trawlers was 186 in 1986 and they operated by national-owned companies. The number of shrimp trawlers increased to 526 units in 2000, then decreased to 320 units in 2005. The number and size (GT) of shrimp trawlers that operated in Arafura Sea during the period 1992-2006 are presented in Table 5.

Table 5. Number of shrimp trawlers in Arafura waters based on size of vessel.

Year	Number of vessels based on GT				Total (units)
	<50	51-100	101-200	>200	
1992	-	-	-	-	250
1996	39	59	280	53	431
2000	70	207	198	51	526
2004	2	126	174	34	336
2005	2	123	164	31	320
2006	2	123	162	31	318

After a continuous increase since 1975, the number of shrimp trawlers fell in 2003. In fisheries statistics prior to and including 2003, only the Double Rig Shrimp Trawl gear type was listed, however in 2004 the name was changed to BED equipped shrimp net and a new gear type called Stern Shrimp Trawl began to be listed.

Actually, in Arafura Sea there are three main fishing gears for catching demersal fish resources that are shrimp trawl, fish trawl and bottom long line. The annual total catch for those type of fishing gears were fluctuated as shown in Figure 7.

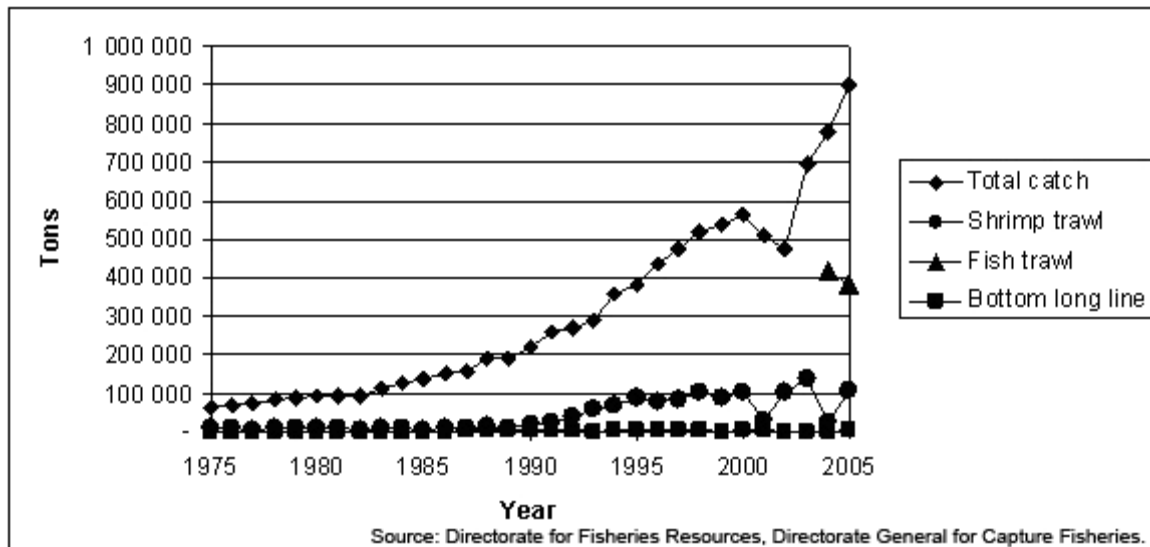


Figure 7 . Annual fluctuation of total catch for three main fishing gears operating in Arafura Sea, 1975-2005 (Wagey et al, 2008).

The significant increase of the total catch in 2004-2005 was mainly contributed by the catch of fish trawl for about 400 thousand tons while the catch of shrimps trawl remain stable in about 100 thousand tons/year. Bottom longlines operated in Arafura sea gave not as big total catch as shrimp and fish trawlers. Shrimp trawl fishing industry operated within Arafura sea can be categorized in different gross tonnage ranges that are 100-150 GT, 151-200 GT, 201-300 GT and >300 GT. Most of the shrimp trawlers operated in Afura Sea are built in 1980s. Most of the vessels have a high fuel consumption that represent about 50 % of the total operation costs. Large shrimp trawlers, >300 GT, have very difficult to maintain profit margin and are more likely to experience deficit up to 255 million/year. Shrimp trawlers within size of 100-150 GT are more likely to earn profits (up to IDR 1.1 billion /year), while shrimps trawler of 151-200 GT and 201-300 GT earn profit about IDR 230 million/year and IDR 381 million/year respectively. Price for windu shrimp is IDR 30.000 – 54.000 /kg, Jerbung shrimp IDR 21.000-44.000/kg and dogol shrimp IDR 17.500-37.000/kg (Monintja *et al*, 2006).

2.2. Policy and regulatory in trawl fisheries

The use of trawl in Indonesian fisheries management area is actually banned since 1980 by the Presidential Decree No. 39 Year 1980 on Trawl Net Elimination. The elimination was done step by step until 1982 when Presidential Instruction No. 11 Year 1982, recognized January 1st 1983 as the date for which there should be no fishing using trawl net in Indonesia. The basic consideration of Presidential Decree No. 39 Year 1980 was for the conservation of fishery resources to support the increase of the production by the traditional fisherman and prevent the social conflict. In 1982, however, it was launched an exception of trawl usage: the use of shrimp trawl net (and its substitutes) was allowed in the sea water of Kei Islands, Tanimbar, Aru, Irian Jaya, and the Arafura's sea with a coordinate

border 130° BT to the east. This action was driven by the existing Japanese investor on shrimp fishery in those areas.

Following this Presidential Decree it was announced the Decree of Ministry of Agriculture No. 930/Kpts/Um/12/1982 concerning the implementation of Presidential Decree No. 85 Year 1982 in December 27th 1982 and Director General of Fisheries is empowered to determine the construction of shrimp trawl by Director General Decree No. IK.010/S3.8075/82 on The Shrimp Trawl Net Construction (December 31st, 1982).

There are some regulations which related to trawl fisheries management in Indonesia as following:

- Ministry of Agriculture Decree No. 503/Kpts/Um/7/1980, the first steps to implement the elimination for the use of trawl net. This Decree completed Presidential Decree 39 Year 1980 and gives detail definitions of Trawl Net.
- Ministry of Agriculture Decree Number 694/Kpts/Um/9/1980 on Limitation of Fishing Zone for Business of Trawl Fisheries. This Decree establishes the boundaries of Indonesian fishing zone which are forbidden for fishing operation by trawl net.
- Ministry of Agriculture Decree No. 542/Kpts/Um/6/1981 on Determination Number of Trawl Ships in the Province Out side of Java, Bali, and Sumatera. This Decree governs the number of Trawl ship in The Province outside Java, Bali, and Sumatera and the operation of those ships have to follow the direction and conduct consultation with Director General of Fisheries.
- Ministry of Agriculture Decree No. 392 Year 1999 on Fishing Zone. This Decree determines closed zone for ships using Trawl net and states the kind of Trawl Net that cannot be used.
- Ministry of Agriculture Decree No. 770/Kpts/IK.120/10/96 about The Usage of Fish Trawl Net in IEEZ India Ocean Western Sumatera and Surrounding D.I. Aceh
- Ministry of Agriculture Decree No. 1039.1/Kpts/IK.120/10/99 on The Change of The Ministry of Agriculture Decree No. 770/Kpts/IK.120/10/96 on The Usage of Fish Trawl Net in IEEZ India Ocean Western Sumatera and Surrounding D.I. Aceh
- Directorate General of Fisheries Decree No. 868/Kpts/IK.340/II/2000 -The Construction of Fishes Separating Devices (API/TED) and Fishing Ground for Shrimp Trawl Net.
- Ministry of Marine Affairs and Fisheries Decree No. 06/Men/2008 Regarding on Trawl Net operation in the northern part of East Kalimantan (Makassar Strait).

Concerning with above regulations the use of trawl net has been illegal in Indonesia since 1980 except where permitted under the Presidential Decree No. 85 Year 1982 and other regulations. It is, however, difficult to implement these regulations since trawl is unarguably the most efficient and effective means to catch shrimp and other bottom species. Several exceptions have been made toward Presidential Decree No. 39 Year 1980, based on the reasons of foreign investment and for the need to utilize EEZ, and there are certain areas in Indonesian that still could be exploited by trawl net. Unfortunately those exceptions are considered unsatisfied and the result undeniably is the legal smuggling done by fishermen all over Indonesia, especially in the areas where it is forbidden to use trawl.

Fishermen make a substitute of trawl gear and call it with different name (local name: jaring arad, lampara dasar, cantrang, etc.) so that it could be used legally. It has to be acknowledged however that such tool has similar function with trawl and could be categorized as trawl. This condition has taken place until present time.

Local regulations:

In the East Kalimantan (Makassar Strait) there is a Memorandum of Understanding (MOU) between Head of District Nunukan, Bulungan, Berau, and Mayor of Tarakan concerning Management and Exploitation of Fish Resources in East Kalimantan Border Area, signed in Balikpapan on 17 May 2003. This MOU regulates several things such as:

- The exploitation of fish resources should not exceed the sustainable production capacity of natural resources.
- The license for fishing exploitation is only given to the fishing ship from the District of Nunukan, Bulungan, Berau, and Tarakan City.
- The issuance of ship license shall be in accordance with national regulation on licensing
- Fishing tools should be effective and productive and should not damage fish resources and its environment (includes trawl gears). In special cases, the use of certain fishing device is required to be completed with assisting device.
- Specification for fishing device unit will be determined by the Minister of Marine Affairs and Fishery, by considering the existed condition.

In general, fisheries management in Indonesia applied is based on Fisheries Act No.31 of 2004 and revised Act No. 45 of 2009. On the basis of above act, the Central Government has overall responsibility to manage fisheries in the Indonesian fisheries management zone. Fisheries management measures that should be complied when people conduct fishing activities, include, among others, as following:

- Type, quantity, and size of fishing gears;
- Type, quantity, size and position of auxiliaries gears;
- Areas, zones, and seasons for fishing;
- Requirements and standard operational procedures for fishing;
- Fishing vessel monitoring system (VMS);
- Prevention of pollution and degradation of fish stocks and their environment;
- Minimum size (weight) of each fish species allowed to be caught;
- Setting of Fishery reserves area;
- Protected fish species.

Those fisheries management measures that have been implemented in the Arafura shrimp trawl fishing included: (1) type, quantity, and size of fishing gears, (2) areas and

zones for fishing activities, (3) requirements and standard operational procedures for fishing, and (4) vessel monitoring system (VMS).

Promulgation of the Indonesian Act Number 32 2004 on Local Government provides the Provincial Government with an authority to manage natural resources, including fish resources in the sea as far as 12 nautical miles from coastline, one third of this area is managed by District Government. Moreover, the Central Government has authorized the Local Government some of its mandate in the fisheries management, including the issuance of fishing license and registration for vessels of up to 30 GT. Fishing license for vessels of greater than 10 GT up to 30 GT is authorized by the Provincial Government, while the vessel size of 10 GT is authorized by District Government.

SECTION 3: KEY ACTIVITIES, STRUCTURES AND PERCEPTIONS

3.1. Programs and Activities to Support Bycatch Management and Sustainable Fisheries

There are two types of government activities to support by catch management and sustainable fisheries, firstly, those related to the regulation and secondly, adoption of BRD for shrimp trawl fisheries resulting from REBYC I project. No specific regulations focus on bycatch management excepted Directorate General of Fisheries Decree No. 868/Kpts/IK.340/II/2000 which considering on Construction of Fishes Separating Devices (API/TED) and Fishing Ground for Shrimp Trawl Net. This regulation are actually mentioned to reduce sea turtle bycatch caught by shrimp trawlers.

In general, fisheries management within the Indonesian fisheries management areas stated on Fisheries Act No. 31 of 2004 in Article 7, as following:

For supporting fish resources magement policy, the Minister shall establish: fisheries management plan; the potential and allocation of fish resources; total allowable catch; types, quantity, size and auxelaries fishing gears; areas, zones, and period and season for fishing; standard operational procedure; fishing vessel monitoring system; rehabilitation and enhancement of fish resources; size or minimum weight of fish species allowed to be caught; protected fish species.

There are no donor funded projects especially on bycatch management. However, Indonesian WWF carried out monitoring program on sea turtle by catch through observer program in shrimp trawl fisheries in Arafura sea.

Directorate of Fish Resources under Directorate General of Capture Fisheries has responsibility on planning management measures on marine capture fisheries. Reseach Center for Capture Fisheries produces scientific information based on research activities. For fisheries management plan, there is annual forum for discussing the status of fish resources

and some social economic aspects with participating from stake holder such as Fisheries Trawl Assosiation.

Research on BED or TED was conducted by Research Institute for Marine Fisheries (RIMF) for industrial shrimp trawl fishing in 1982 in the Arafura Sea. Collaborative scientific trials on BED were conducted between BPPT, RIMF and DG Fisheries and University in Arafura sea in 1982. Scientific trial by RIMF using TED super shooter in 2004 for reducing bycatch. Experimental fishing using JTED installed in shrimp trawl fishing carried out in Arafura Sea in 2004 collaborated with SEAFDEC.

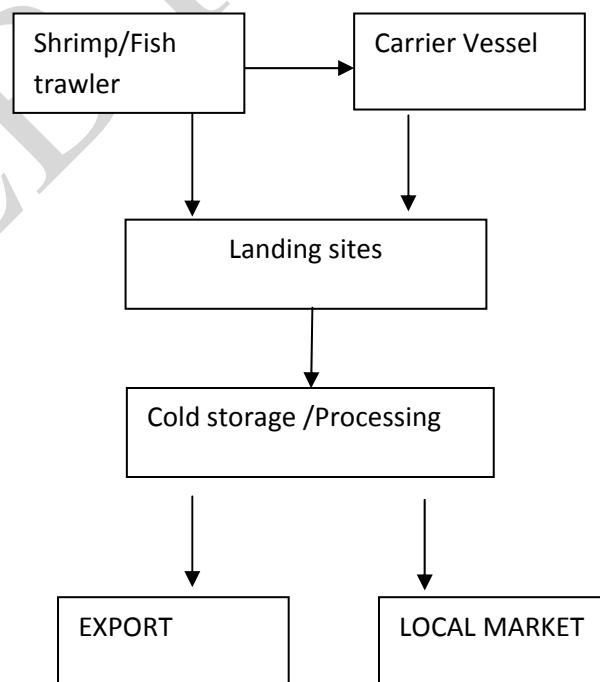
There is no information regarding bycatch postharvest utilization, product/marketing improvements and demand analyses, studies of the impact of trawling on seabed habitats, and the techno-economic impacts of changes in management measures to the commercial fleet.

3.2. Relationship between fishermen, managers and researchers

Based on the results of scientific work, DG Capture Fisheries formulates the regulations regarding the management of bycatch and discard in accordance with the regulation of fisheries management plan in Indonesia. Awareness raising campaigns are conducted by local staff of fisheries (Province and district) targeted to local fishermen. The implemetation of these regulations are monitored and controlled by DG Capture Fisheries.

3.3. Market drivers:

Market / value-chain structure for catch and by-catch products is shown as figure below.



- Existing eco-labeling and or certification schemes

Eco-labelling and or certification schemes have become an important concern for Indonesian government and stakeholders in order to remain able to export the fish product to the countries that put the certification as an obligatory of export document. This particularly for the catch of shrimps trawler and tuna longliner. The implementation of ecolabelling related to the IUU fishing has been implemented from January 2010. This particularly purposed to export markets while domestic market not yet obligate to this pursue.

- Existing or likely future price premiums for “eco-friendly” products

Some Indonesian company, e.g. PT. Anova cooperated with WWF has introduced kind of SMART gear for eco friendly fishing (tuna and shrimps). The product of this smart gear will reward a higher price compare to the conventional one.

- Domestic consumers’ perception of “eco-friendly” products (awareness of the concept)

Domestic consumers are still in a lack awareness of the concept eco friendly products.

SECTION 4: PROJECT FORMULATION

4.1. Expected impact of the project

After the completion of the project, the Indonesian trawl fisheries should have a new policy and regulation to improve trawl fisheries management and practices. The trawl fisheries should be able to reduce bycatch, discards and the impact on biodiversity and the environment strongly supported by the government and communities. In the long term, sustainable fisheries resources, improved livelihoods and healthy marine ecosystem should be achieved. Fishermen could catch a bigger size of fish specimen with a higher value. The fishing practices in use minimize the quantity of discards and optimally utilize bycatches with minimum or no habitat destruction. Post harvest sector is able to appropriately handle the volume of the catch and overall catch value is increased. No conflict between resources users with a considerably high compliance due to a good understanding and clear structure of government, private sector and social society. Finally Indonesia will also be able to actively involved in a good regional cooperation on bycatch management

4.2. The beneficiaries and stakeholders

The trawl fishers and the whole private sector as the first level users of fish resources will directly take the most benefit from the success of the project. Formal government institution will take indirect beneficiaries from the success of the project in terms of managing the sustainable fish resources of trawl fisheries.

There will be a wide and various stakeholders involved in the project:

- Ministerial of Marine and Fisheries (MMAF),
- Academic (University)
- Research institute
- Indonesian Navy
- Vessel operator
- Local government unit,
- Non Government Organization (NGO): WWF,
- Fisheries Association: HNSI, ASPINTU, HPPI
- Private sectors
- Traditional/small scale fishermen

4.3. Expected outcomes

There will several expected outcomes resulting from the project that is:

1. Effective policies, legislation, regulations and institutional arrangements for responsible trawl fisheries
2. Management measures put in place which reduce bycatch and discards and improve fisheries resources and the resulting economic benefits
3. Robust information system that collect and disseminate data to inform trawl fisheries management decisions and implementation are input in place
4. Better understanding of responsible fishing leads to improved in fishing practices and policies, which are communicated within regional frameworks, including ASEAN and Coral Triangle Initiative

4.4. Expected outputs

Possible outputs resulting from the project are:

1. New regulation on responsible trawl fisheries and bycatch
2. New regulation on best practices trawl fisheries and bycatch
3. New regulation on handling and utilization discard
4. New regulation on Maps of Fishing gears Management Zone
5. Strengthened capacity of stakeholder groups
6. Appropriate fishing gear for decreasing bycatch
7. Development of BRDs and wide adoption of BRDs by fishers
8. Adoption of bycatch management guidelines
9. Adoption of closed season and area management (MPAs)
10. Clear understanding over the definition of bycatch

11. Awareness raising of bycatch issue
12. Dissemination of project results
13. Sea bed ground and bathymetry data
14. Map of trawl fisheries zone with a complete of bathymetry illustration.
15. Existing Observer & enumerator program for trawl fisheries
16. Implementation of fishing Log book
17. Reduction of the number of existing fishing vessels in cases where there is overcapacity in relation to fisheries resources
18. Biodiversity, biological data (length-weight and maturity stages on selected important species
19. Improvement on community participation on bycatch management
20. Improvement on VMS and MCS program

4.5. Main activities

Some activities to achieve the outcome from the projects are:

- Public consultation, drafting of new regulation on responsible trawl fisheries and bycatch
- Public consultation, drafting on best practices trawl fisheries and by-catch
- Public consultation, drafting on discard handling and utilization
- Public consultation, drafting on maps of fishing gears management zone
- Research on biodiversity, biology and environment of demersal fishes on selected FMA (Fisheries management area)
- Study on selectivity of fishing gear and impact of fishing operation to fisheries resource and environment
- Study on minimum fish size landed (based on maturity of target species) in trawl fisheries
- Training of observers for observer programs, log-book program for trawl fisheries
- Improvement of VMS
- Study on fishing capacity for trawl fisheries using DEA Analysis
- Introduction of fish separator and utilization of discard
- Improvement data collection related to by-catch and discard from trawl fisheries by landing sites
- Observer program for collecting data bycatch and discard for trawl fisheries
- Fish stock assessment based on landing size data
- Collecting appropriate basic data of fisheries fishing capacity analysis
- Training (capacity building) to improve effective fishing Management Forum
- Training on fish handling and processing for optimum utilization

- Building public awareness on bycatch and trawl fisheries
- Extension and dissemination of law enforcement for officer and stake holder
- Public awareness on fisheries resources
- Dissemination and workshop appropriate BRD for small and large trawl fisheries
- Produce and published technical guidance on TED and BRD
- Workshop on impact of trawl fisheries and implementing best practices trawl fisheries and reduction bycatch
- Dissemination on maps of fishing gears management zone for improving trawl fisheries management and practices.
- Monitoring and evaluation

4.6. Implementation and management arrangements

Consultations and collaboration arrangement with private sector and stakeholders can be performed through scheduled workshop and training related to the trawl fisheries.

4.7. Risks:

The main risks for not achieving the outputs and outcomes of the project are: lack of political support of the authorized person, lack of willingness and co-operation of fishers, lack of economic incentives, market drivers that encourage harvesting bycatch, lack of human resources to carry out the activities, lack of coordination between central and local government, reluctant participation from fishing sectors, user conflict, data incomplete due to IUU and transshipment practices, weak enforcement and a grower concern on short term impacts rather than long-term benefits.

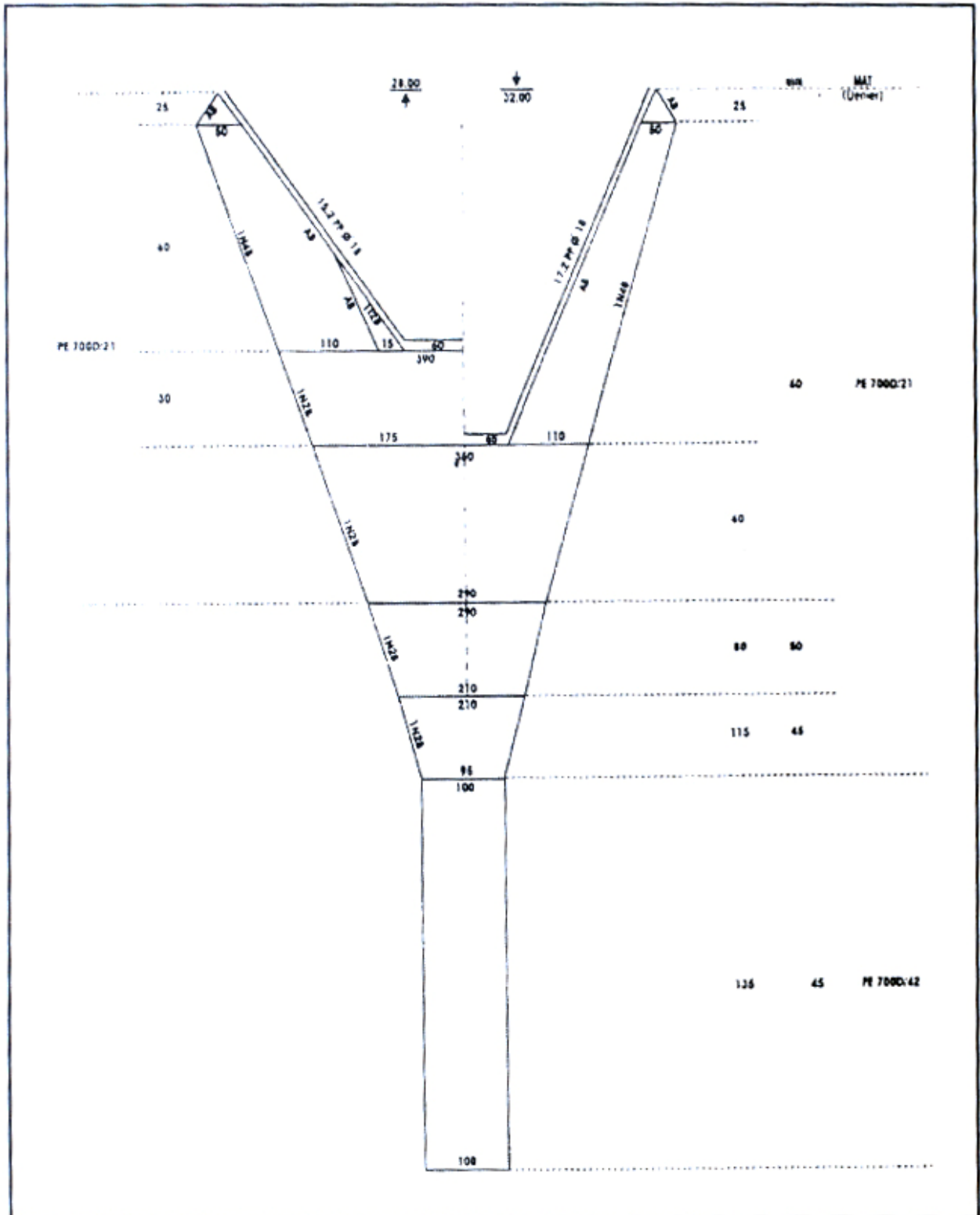
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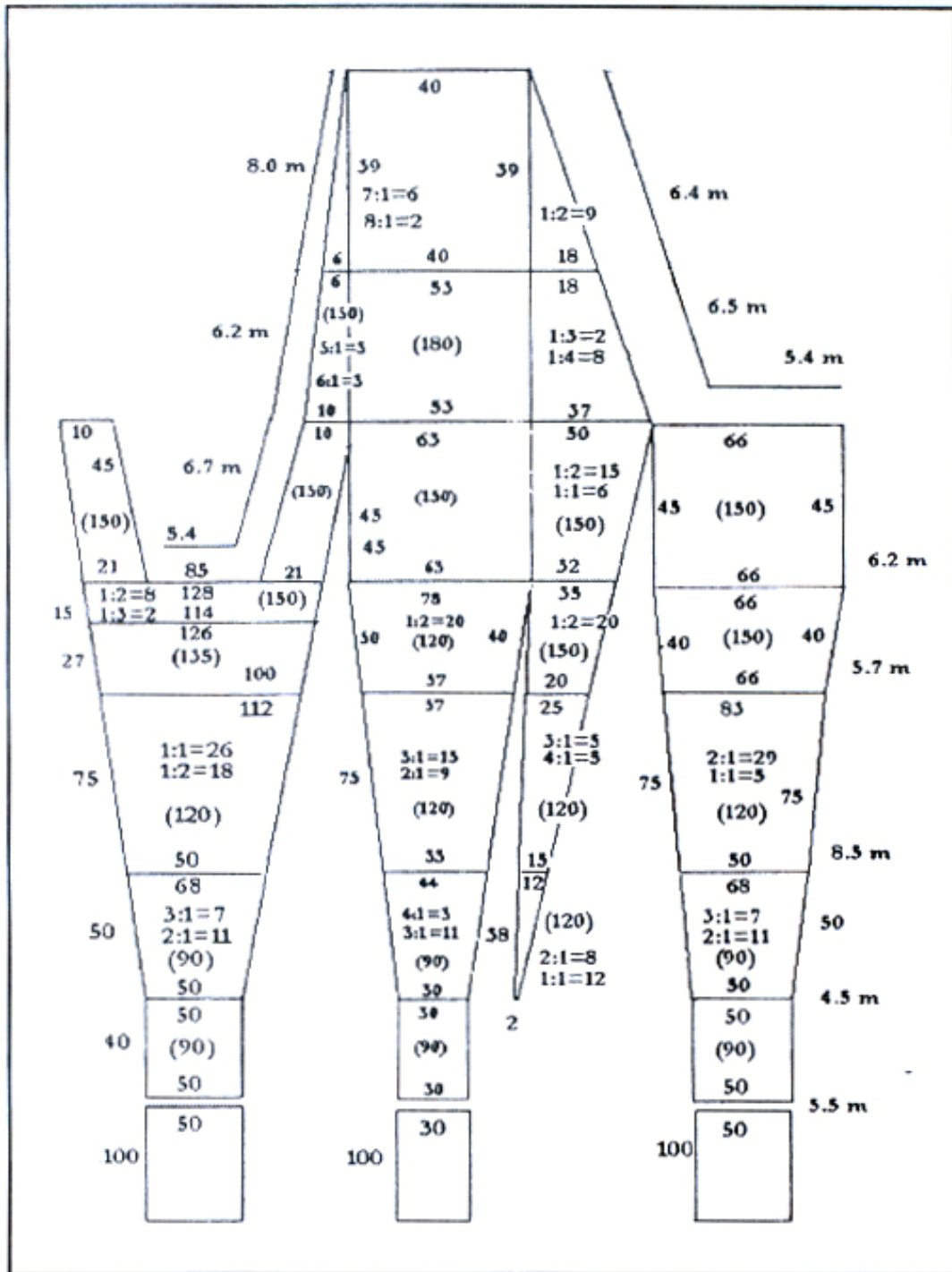
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Appendix 1. Shrimp trawl net design of KM. Kokas 18 with HR 25 meter operated in Bentuni Bay Arafura Sea.



Appendix 3. General design of Fish trawl net of fishing boat 180-200 GT in Arafura sea.



Appendix 4. Traditional shrimp trawl net design with HR 13.4 meter operated in Tarakan waters, East Kalimantan (PRPT-BPPI 2006)

