

# REVIEW AND STUDIES OF CAPTURE FISHERIES IN JAVA ISLAND: FUTURE STRATEGIES ROLE AND PROSPECT'S PROMOTING OF FISHERY DEVELOPMENT IN INDONESIA AND DEALING WITH NATIONAL AND GLOBAL CHALLENGES

By

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## ABSTRACT

*Capture fisheries in Java Island had played important part since long time ago on Indonesia marine and fisheries developing. Capture fisheries activity bases in Java Island, increasingly grown, interesting to inspect remember fish resources (SDI) potency of Java Sea increasingly decrease and over fishing. Various aspect of capture fisheries condition, strategic role and how to face national and global challenge has inspect. Fish resources (SDI) potency of Java Sea decrease, it turned out give small influence for Java Island capture fisheries growth. Besides it "traditional" role that already take place since long time ago which Java Island fisheries growth it self, also had national strategic role. Various efforts need to work for increasing Java Island capture fisheries competition: fish resources stock studies periodically, increase capture fisheries capability in various aspect, increase catch product quality, FP/FLP utilization so become grow in activity and increase capability in face national and global challenge in fisheries field. Capture fisheries in North Coast of Java need rearrangement meanwhile South Java need to develop. Capture fisheries of Java Island has obligation to be more active motivate and strive for so growth centre develop in outside Java. Main key is developing local market and export market.*

## 1 Introduction

Since long time ago has known (Since 1970-s, when Indonesia capture fisheries started attainment data statistically) that Java Island capture fisheries play important role in Indonesia fisheries development, because of geographic reason and centre of government, better infrastructure, reasons of fish resources potency in Java Island that still high, or even reason of amount capture fisheries activity and high citizen population (high needs of protein).

Along with time running, high increasing capture fisheries activity, cause over fishing faster in Java Sea. But bigger "attraction" of high amount community fish protein necessity (high market absorb) and provide more Infrastructure-tools capture fisheries, making Java Island capture fisheries until now, and in the future in quite long time, admit it or not, still going play important role in Indonesia capture fisheries. Main key is Java Island market amounting to 23.4 % from total 3 966 480 ton production catch product in Indonesia Oceans in 2001, landed in Java Island (Anonymous, 2003).



Java Island capture fisheries activity in North Coast (*Pantura*) of Java and remains in *Pansela* (South Coast) of Java. Amounting to 87.4 % from total 929 072 ton catch production that landed in Java Island year 2001, landed in North Coast of Java; only 12.6 % in South Coast of Java (Anonymous, 2003). Sea waters of Java Island capture fisheries covers Fisheries Management Zone 3 (WPP 3) and a half Indian Oceans (WPP 9).

Along with time also, Java Island fisherman that in the beginning catch in Java Sea, next as caused of over fishing, already operate outside Java Sea, reach Natuna Sea (South China Sea), Maccassar straits waters, South Celebes), and etc. Period demand growth that happened as national and even global, when Java Island capture fisheries condition nowadays, make question: "How play roles on future strategic and prospect of Java Island capture fisheries in developing Indonesia fisheries and dealing national and global challenge?" This studies trying answers those questions above.

## 2 Studies Methodology

Studies is use literature studies and statistic data Java Island capture fisheries also based on field experience and Java Island capture fisheries analysis in various aspect, that work by IPB Marine Science and Fisheries Faculty team.

## 3 Result and Discussion

### 3.1. Java Island Capture fisheries Condition in Various Aspect

#### 3.1.1. Fish Resources (Java Sea and Indian Ocean/South Java)

Java Sea rich by kinds of demersal fish (Sea catfish/*manyung*, snapper/*ikan merah*, hairtails/*layur*), small pelagic fish (scads/*layang*, fringescale sardinella/*tembang*, indian mackerels/*kembung*, etc), big pelagic fish (Eastern little tuna/*tongkol*, Indo-Pacific king mackerel/*tenggiri*), meanwhile in South Java waters small pelagic fish (indian oil sardine/*lemuru*, *layang*), big pelagic fish (*tongkol*, *tuna*), demersal fish (*layur*).

Although thus, Java Sea waters have over fishing:

- In 1998, Java Sea fish resources exploitation have reach level 112 % from evenly potency, and increase become 113 % in 2000. Evenly potency reach 861 174 ton per year (Table 1; Widodo, 1998). In 2001 estimate all group kinds of fish has already over fishing (Table 3).

On the other way in South Java/Indian Oceans, except group kinds of demersal fish, coral fish, shrimp and squid, others (big pelagic fish group: *tuna*, *cakalang*, *tongkol*) have not over fishing. In 1998, exploitation level kinds of fish per group only reach 11 -75 % an in 2001 have reach 13 - >189 % kinds of fish per group (Table 2 and 3) (Anonymous, 2004).



### 3.1.2. Java Island Capture fisheries Activity

Java Island capture fisheries activity in 2001 reflect as next :

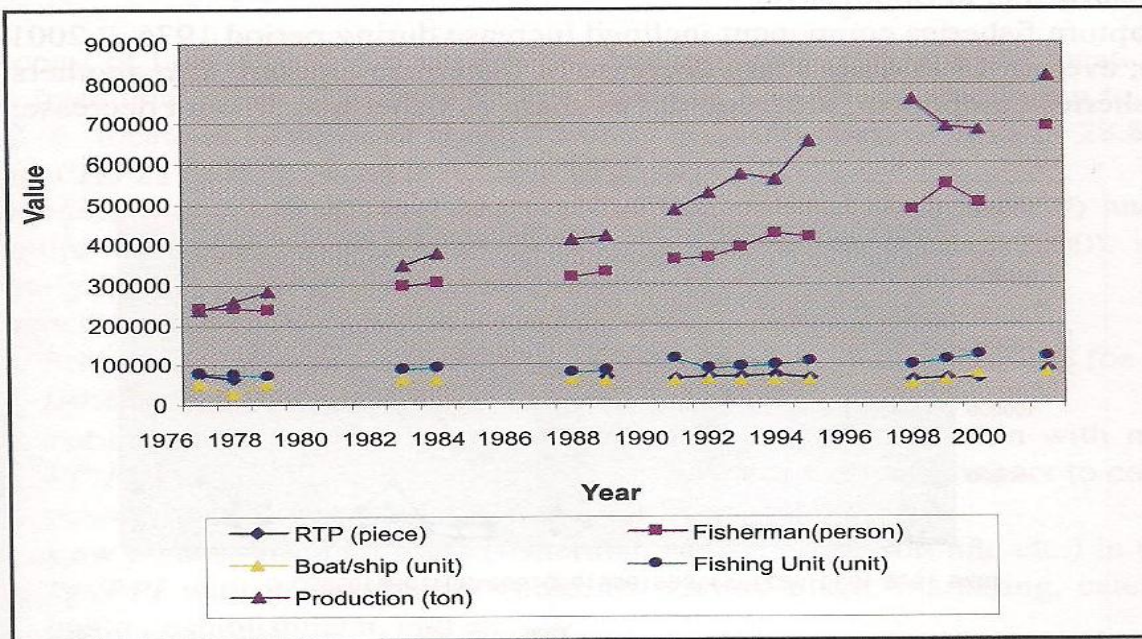
Table 4. Reflect of Java Island capture fisheries activity, 2001

Items	Amount in North Java	Amount in South Java	Amount in Java Island	Amount in Indonesia	Percentage about Indonesia (%)	Percentage in North Java (%)	Percentage in South Java (%)
1. Fisherman (person)	690 791	188 569	879 360	2 562 945	34.3%	78.6	21.4
2. RTP	81 062	20 960	102 022	514 291	19.8%	79.5	20.5
3. Fleet (unit):							
PTM	14 661	6 174	20 835	241 714	8.6%	70.4	29.6
PMT	51 975	11 499	63 474	120 054	52.9%	81.9	18.1
KM:	6 928	1 714	8 642	106 753	8.1%	80.2	19.8
Amount	<b>73 564</b>	<b>19 387</b>	<b>92 951</b>	<b>468 521</b>	<b>19.8%</b>	<b>79.1</b>	<b>20.9</b>
4. Fishing Unit :							
Amount (unit)	114 592	51 672	166 264	829 459	20.0%	68.9	31.1
Dominant kinds	Payang, trammel net, gillnet, trap	Fishhook, trap, gillnet	-	-	-	-	-
5. Production landed (ton)	812 468	116 604	929 072	3 966 480	23.4%	87.4	12.6
6. Production value (Rp million)	3 687 701	493 850	4 181 551	22 154 236	18.9%	88.2	11.8
7. Dominant kinds of fish	Layang, tembang, kembung, tongkol, peperek	lemuru, layang, tongkol, tuna, layur	-	-	-	-	-
8. Fishing ground	Java Sea, Natuna Sea - West west Borneo (Kalimantan, Macassar (Makassar) Straits, South Celebes (Sulawesi)	South Java coast waters	-	-	-	-	-



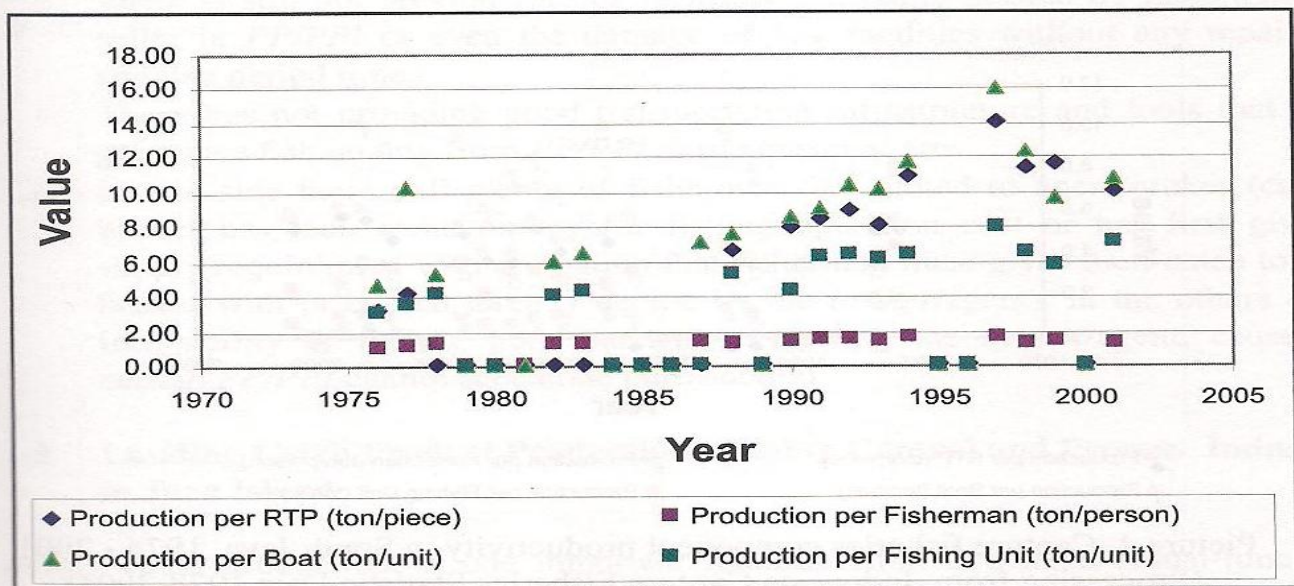
- (1). Java Island capture fisheries representation quite high activity about Indonesia capture fisheries activity; that seen by 18.9 – 34.3 % from indicator/ components capture fisheries activity (fisherman amount, fisheries household, fishing fleet, catch unit, catch production volume and value) (Table 4) work by Java Island fisherman.
- (2). North coast of Java capture fisheries:
  - Has higher activity compare with south Java; it indicate by 68.9 – 79.5 % from indicator/components capture fisheries activity work by North Java coast fisherman.
  - Has variety kinds and fishing tecnology that higher compare in south Java.
- (3). Plenties fleet amount in Java Island was motor adhere boat (*PTM*) fleet and boat without motor; it means fishing operational reach powers mostly from fleet that there inclined only strict on coast waters, only less that able reach offshore, or even Indonesia EEZ waters.
- (4). Although mostly fisherman amount in Java Island, but last education and skill from fisherman individu commonly known quite low.
- (5). Catch production volume landed 929 072 ton and production value Rp3 687.7 billion. Production volume are 23.42 % from total Indonesia Ocean catch production,:
  - In North coast of Java landed 812 468 ton or 87.4 % from all catch production that landed in Java Island.
  - Dominant catch production:
    - In North coast of Java: *layang, tembang, kembung, tongkol, peperek*
    - In South coast of Java: *lemuru, layang, tongkol, tuna, layur*
  - Highest production volume according to kinds of fishing unit : purse seine (In north coast of Java: 30 %, in south coast of Java 20 %) from total production.
- (6). In North coast of Java:
  - Generally indicator/components capture fisheries and sea fish production inclined increasing, but last five years there is fluctuation with increasing tendency (Picture 1).





Picture 1. Capture fisheries component growth in North Java, 1976-2001 (Processing from Indonesia Capture fisheries Statistic Data 1978-2003)

Relative sharp productivity decrease from each component, happens last five years (*RTP* productivity, boat/vessel and fishing unit), even-though in 2001 relative increase again. Fisherman productivity inclined stagnant (Picture 2).

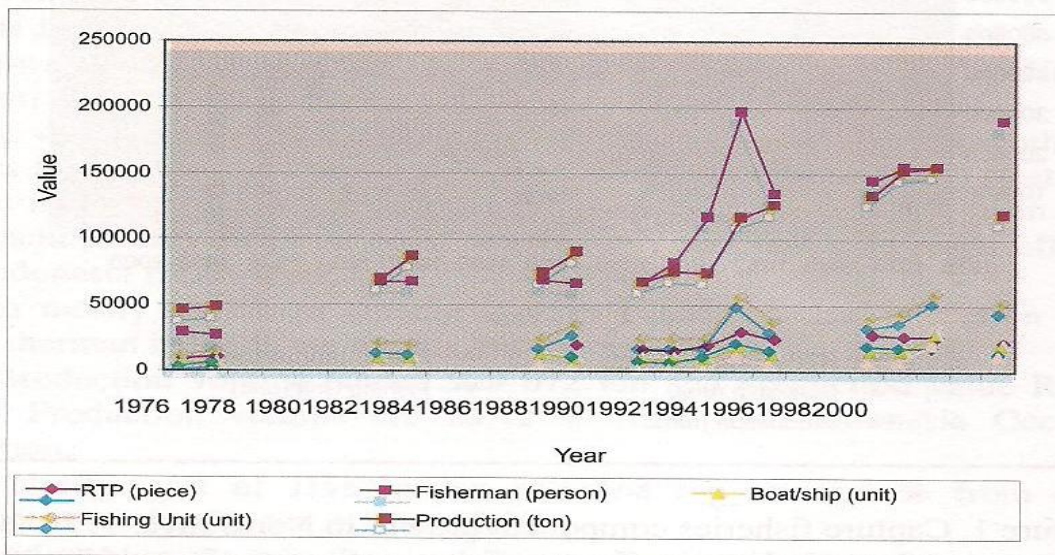


Picture 2. Capture fisheries component productivity in North Java 1976 - 2001 (Processing from Indonesia Capture Fisheries Statistic Data 1978-2003)



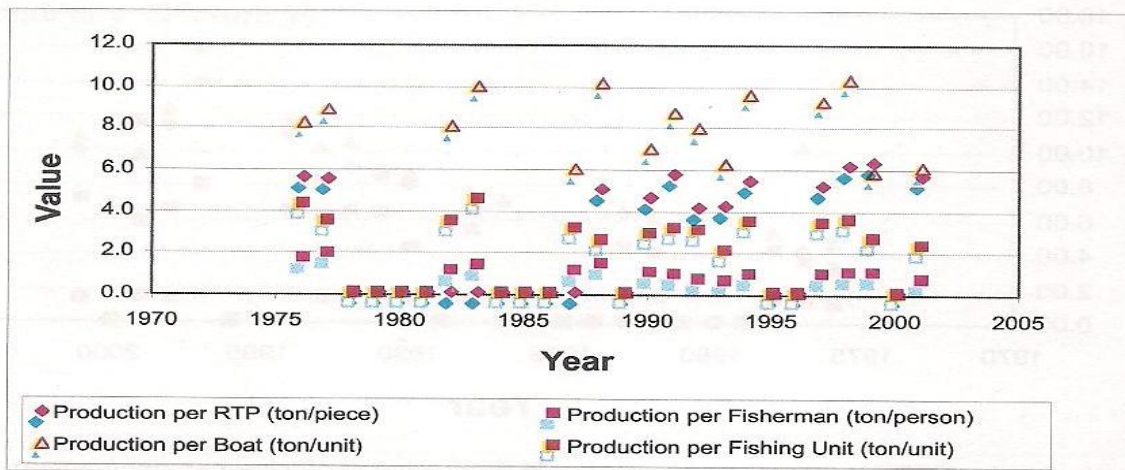
(7). Meanwhile, in South Java:

- Capture fisheries component inclined increase during period 1976 - 2001 (Picture 3); even in 1993 quite sharp decrease of fisherman amount, also another capture fisheries component, although not as sharp as fisherman amount decrease.



Picture 3. Capture fisheries component growth in South Java , 1976 - 2001 (Processing from Indonesia Capture fisheries Statistic Data 1978-2003)

- Capture fisheries component productivities: fluctuation, but in the last 2001 inclined decrease (Picture 4).



Picture 4. Capture fisheries component productivity in South Java, 1976 - 2001 (Processing from Indonesia Capture Fisheries Statistic Data 1978-2003)



### 3.1.3. Java Island Capture fisheries Infrastructure

North coast of Java is fishing port (*PP*)/fish landing place (*PPI*) biggest location in Java Island; from total about 250 *PP/PPI* that locate in Java Island amounting to 178 units or 71.2 % locate in North Java coast, 72 units in South coast of Java or 28.8 %. Only less part *PP/PPI* in Java Island that begin to grow:

- a. Amounting to 70 % *PP* that has not function optimal (Lubis, 1999) and has not require with modern facilities that direct to efficiency (Lubis, 2000), show that mostly fishing port has not develop yet.
- b. There are many factor making it reasons, another else:
  - Still low of human resources quality of fishing port user, foe example fisherman, seller, etc.
  - Public function that still very dominant in *PP/PPI*, still seen with manage of *PP/PPI* in Indonesia by centre government or hinterland, impact to competition power (inside and outside) that still far from optimal.
  - Low concise from all users (fisherman, seller, processor, and etc.) in utilization *PP/PPI* with as good as possible; as landing place, marketing, catch product quality establishment, and etc.
  - Still expensive of operational cost in working fishing operation especially because fuel (*BBM*) is very expensive (that should be subsidies for *BBM* especially for traditional fisherman), impact to fisherman decides to better sell the fish to collector in the middle of the sea so can more press operational cost.
  - There is no full security guarantee for stakeholders (fisherman and fish seller) in certain *PP/PPI*, that make them deal with hoodlums (street kids) when fisherman landing their catch or when fish seller brought fish from outside region to fishing port.
  - There is still not provide various facilities that really needed by fisherman or seller in *PP/PPI* or even the damage of few facilities without any repair in suitable period time.
  - There has not providing good transportation infrastructure and tools that can guarantee fish quality from *PP/PPI* until consumer area.
  - In one side there still plenty of fisherman that linked to agent/broker (cause broker has loan some money for fishing operation cost or has first giving supply requirement with obligation that fisherman must gives their catch to the broker with price that already decide by the *broker/agent*), in the others side incapability of fishing port manager in dealing the *broker/agent*, cause in certain *PP/PPI* cannot accelerate pure auction.

### 3.1.4. Landing Catch Product Production, Quality Control and Process Industry in Java Island

Landing catch production, is one important function from two main actual-function from *PP/PPI* in Indonesia, which sail supply servicing function and production function (Lubis, E. dan AB. Pane, 2001). Landing catch production function, has great



connection with landing process and landing catch providing capability by some *PP/PPI*, in quantities and quality. Because of that landing catch production function that landed is first indicator to know some *PP/PPI* advance.

In quite significant percentage, 23.42 % from 3 966 480 ton Indonesia ocean fish catch production in 2001, landed in Java Island *PP/PPI*. This shows that *PP/PPI* role in Java Island in landing of catch so significant in capture fisheries in Indonesia. Draw very important catch production function Java Island in Indonesia all at once.

In Java Island, biggest production function is in North Coast of Java (*Pantura Jawa*), where 87.44 % from total 929 072 ton Java Island catch production in 2001, landed in North Coast of Java and the rest (12.55 %) landed in South Coast of Java.

Catch product handling practice in Indonesia generally, include Java Island, has not qualified, in techniques or even sanitation.

- a. Cool chain in handling fish catch has not fully applied.
- b. Handling chain to long and interrupted,
- c. Slow handling tempo and,
- d. Many careless also affecting by waste.

In technologies, it makes catch fish quality loss because can cause rotten, physical damage and contaminated by waste. Therefore the result happen very big loss. Nevertheless, mostly big scale fishing corporation that has applied good handling principal because has capital capability and high skill. With applied cooling techniques and freezing make vessel able, to operate in more far distance and long period without any worries will show quality damage to catch product.

Catch fish that landed in *PP/PPI* plenty that unsuitable to consume requirement because has physic damage and microbiologist rotten. Damage as long as handling in land, quality damage and nutrient traditional process product as long as processing and distribution, shows how big loss that happen time after harvest all this time that need technologies solutions.

Catch fish handling problems on small-scale fisheries industry are:

- a. Various fish species so sorting, cleaned, using standard plate and etc. Hard to do remember handling facilities complete in vessel;
- b. Air temperature that quite even high (30° C) in coast along years;
- c. Tropic fisheries characteristic that has various kinds of fish but less population demand very selective handling;
- d. Sea waters temperature that high enable fish already in quality decrease stage when entering into the net;
- e. Quality decrease speed that diffrent between kinds of fish will gives less good result if catch product safe into bulk in mix condition. Slow handling means let the fish hit by high air temperature effect and making quality decrease faster;



- f. Common community and especially fisherman:
  - Less inspired the important of sanitation as a life needs and existence.
  - Community cleans level and it environment, especially in fisheries activity centre still very low, meanwhile in handling food product especially fish very demanding high sanitation level.
- g. Water and clean ice has not enough provide and spread on every fisheries activity centre. High price and sometimes it is very difficult to get in needed time.
- h. Lack of tools and support facilities of handling fish catch product, amount or even quality so cannot guarantee smoothness, speed and exact handling that more perfect and sanitary.

Process fish that produce by small fisherman in Java that spread into huge region the amount is small. The production is very influence by seasons so the characteristic fluctuate along the years. The up and down of production has tight connection with raw material requirement, that influence straight to fish process corporation activity. In fish peak season, fish production is very abundant so sometimes process/preserving facilities cannot retain those catch product surplus. In contrary if not in fish seasons, it is very hard to get raw materials for processing corporation.

Modern fish processing corporation generally orientate to export product and give priority to export market, that consist from freezing product and fish canned. Fisheries product comodities that mostly exported are alive shrimp, fresh, freeze and canned product; tuna and skipjack termasuk big-eye, albacore, yellowfin tuna, blue fin and skipjack in fresh form, freeze and canned fish. Others commodity that exported and has important economic potency, which frog thigh, sea adorn fish, sea grass and jelly fish meat, barramundi, crab/small crab canned meat, lobster and etc.

Fisheries product export in 2000 amounting to 519 415 ton with value US\$ 1 675 073 increase to 696 290 ton with value US\$ 2 004 067 in 2003. (has not known fisheries product export from Java Island).

Few constraint that still influence fisheries export, are:

- Few importer country inclined thighting regulations and or entering new regulations that connect to quality or even environment issue,
- Still high import fare, for example Uni Eropa put fare 24% for imported canned tuna,
- Variation of capture fisheries product kinds that exported was variety,
- Decreasing fisheries product sell price in international market.

For handle those constraints, government through Ministry of Marine Affairs and Fisheries take on various efforts, like:

- Increase product quality with applied *HACCP*,
- Increase Quality Monitoring System harmonization with importer partner country in form *MRA/MOU*,
- Marketing netting growth, include diversification to export market,



- Diversification export commodities,
- Increase monitoring effort,
- Developing and strengthening information system (include market intelligence),
- Strengthening examine laboratories and quality training (*LFPMHP*) and fish carantine.

Fish process role in a traditional manner in Java Island has very important meanings because very tight connection with small scale fisheries corporation. Ninety percents (90%) from fish catch product amount in sea come from artisanal fisheries; almost half of it process in a traditional manner.

Traditional processing ways that mostly done is salting, drying, preserving, curing and sides product processing. The product known as salt fish, dry fish, preserve fish, smoke fish, peda (preserved fish), condiment, shrimp/fish chips and *ebi*/dry shrimp, mostly enjoyed community because suite taste with appetite and relative cheap so becomes daily food menu from most community. Shrimp chips and dry shrimp have penetrate export market.

According estimation 62% animal protein needs for diet Indonesian peoples supplied from fisheries product. Fish consumption growth per national capita period 2000-2003 increase 4.61%, which from 21.57 kg/capita/year become 24.67 kg/capita/year in 2003.

For increasing more fish consumption to community, be found of eat fish champagne as healthy food, sharpen mind and strengthening must continue work with various approach and delivery media. Nevertheless, fish consumption increasing also tight connects with community economic condition if fisheries product price that circulate in market felt still expensive. Therefore, fish consumption inside of country has bigger possibility to increase if community profit level increase.

### 3.1.5. Social Culture and Capture fisheries Intitutional Java Island

- (1). Various condition of social culture and contitutional still experience by fisherman community in Java Island, are:
  - a. Fisherman population of North Coast of Java that crowded, fish resources potency that getting decrease, and etc., gives impact to fisherman profit decrease; mainly small fisherman and crews (*ABK*). Fisherman household profit has variety in each region, as illustration traditional fisherman profits per mounth commonly range between Rp150 000.00 until Rp2 350 000.00. Those profit fluctuated and depends on various aspect like corporation scale, revenue and corporation spend, seasons, tools and fishing fleet, and fishing trip. It is a pity condition, in few coastal area village, there are fisherman profit that lowest than Rp150 000.00. Low profit cause poverty to the fisherman.
  - b. Decreasing profit above continue to impact decrease of environment condition and health that become worse.



- c. Things above getting stronger, with more weakness of fisherman education level and stricter skill that has besides fishing or become a labourer.
- (2). Conflict between fisherman in certain region in Java, still potential to show, for example with fisherman from outside area presence that use "veiled" fishing tools like "*pukat harimau*" (trawl).
- (3). Destructive action in fishing activities, which using explosive material, poison material (potassium cyanide) still exist on fisherman community. Using a poison material, can damage coral and existing various kinds of coral fish that poisoned like napoleon fish (*chelinus*), kerapu (*epinephelus spp.*) and others adorn fish. Those action can happen by various cause another else, poverty factor, less monitoring, stricter work possibility in others sector, and less concise about conservation.

### 3.1.6. Java Island Capture fisheries Economic Aspect

- (1). Java Sea (WPP 3) has verdict as region that already over fishing (biological over fishing and economical over fishing). In understanding that those economic conditions impossible to have new added invest.
- (2). Capture fisheries superiority in Java Island that already has enough fishing port (various type) with quite suitable facilities for applied fisheries product trade activity, local and even export (in main facilities, functional or even supporting) estimate will capable and has good prospect in dealing global growth nowadays.
- (3). Big of invest that already spends in the effort developing various fishing port infrastructure above has draw another invest in fish processing industry sector.

### 3.2. Strategic Role of Capture Fisheries Java Island to Indonesian Fisheries

- (1). Java Island capture fisheries roled very strategic to Indonesian capture fisheries activity. It is support by:
  - a. As mention before on introduction chapter, Java Island geographic position support as the place where Indonesia government center exist.
  - b. Java Island has the most crowded community in Indonesia, that directly also needed food source that relative much more compare to another islands. Therefore capture fisheries of Java Island locate in strategic region that has big demand potency, local demand or even export potency.
    - Local demand potency support by Java Island citizens that very big and mostly enjoy sea fisheries product consumption.
    - Meanwhile export potency very support by :
      - \* Bilateral cooperation or even multilateral between countries in South East Asia, Pacific regional or even international world.
      - \* Infrastructure facility requirement, like : fishing port, fish processing industry region and servicing system (material and financial) export-import activity.



- c. Java Island has the biggest fisherman catch amount and fishing fleet amount compare to another region.
  - d. Capture fisheries tools and Infrastructure that built in Java Island relative more complete compare others island and generally has well operated. It is very supporting to fishing activity that fisherman do. Besides it is also make fisheries export activity to abroad much easier.
  - e. Sea fish production that landed in Java Island is the hugest and reach 23.42 % from all Indonesia sea fish production.
- (2). Strategic role that played by Java Island capture fisheries in Indonesia fisheries developing depths are:
- a. Giving contribution to national fisheries catch production volume about 23.69 % for big pelagic group, 37.58 % for small pelagic group and 31.57 % for demersal fish group.
  - b. Giving contribution to total bruto domestic product (*PDB*) fisheries sector that all round reach 2.21 % with total value Rp46.6 quintillion.
  - c. Giving contribution to inside and outside trade climate to fisheries comodities, in fresh or even process form.
  - d. Giving contribution to invest possibility growth in fisheries sector, invest on: shipyard, fishing tools factory, fishing vessel, fish processing factory, fishing port and fishing technology, also;
  - e. Support to mostly fisherman, traditional fish processor or even fish process industry entrepreneur also others stake holder that plunge into various input requirement economic activity (production factors) of fishing.
- (3). Marine fisheries products realy has exportable characteristic, very enjoyable by the consumen and healty product; because:
- a. Invest climate in marine fisheries sector not influence by Indonesia macro economy condition that still on burried.
  - b. On this sector seen inclined of foreign capital effort increasing in Indonesia; that come from countries like: China, Japan, Korea, Netherland, Belgium and Canada. For example invest that come from Netherland, Sebagai contoh investasi yang berasal dari Belanda, Belgium and Canada estimate reach US\$ 700 millions or about Rp6 129 quintillion that interest to invested in fish processing field. They evaluate that Indonesia fisheries condition has high comparative superiority and competition.

### **3.3. How Capture fisheries In Java Island Dealing Future Global And National Challenge?**

Ahead, things that should be done are:

- (1). Covering back the Java Island fish resources stock potency because Java Island waters (*WPP* 3) has over fishing and not possible a new add invest, so next new invest can go back again.



- (2). Fish resources potency information should be renewed, therefore:
  - Need new studies every years so fish resources potency information always accurate and newest.
  - Certain kinds of fish location information, how many and how much can be exploit are important for fishing effort. Also need to know another information like when is the fish spawn, where is the fish moving directions, and etc.
- (2). Fisherman human resources capability and others fisheries player (fish seller, processor and etc.) need to increase; increasing knowledge and fisherman skill also needed mainly in dealing free market competition like AFTA and etc:
  - To more professional course.
  - Still low of education, need an increase.
  - Loved in profession as fisherman still need to increase: keep as fisherman, child interesting to become fisherman.
  - Fisherman skill need to increase in a integrated manner: fishing, quality control and marketing. Skill increasing to capture fisheries directions that higher corporation scale is one thing that needed to press fish resources exploitation density in Java Island.
- (3). Need capital support that enough for fisherman and others player, like eases in getting capital loan, and etc.
- (4). Various fisherman community utilization program need to do with minimalization way or even omit the social economic asymetry that exist in individu level, communities, and organization in fisherman community level. Efforts in handling fisherman poverty must done in holistic way, give priority to fisherman importance, sustain, and independently. Through various approach, need guarantee that through utilization program can increase fisherman capability to have legal access (capable to access various public service), legal power (have power to take action), and legal authority (has capability in taking decision). Coastal community need to involve in all utilization program stage which is in planning, applying and next action.
- (5). Need to increase fleet capability, as Java Sea fisherman or even South Java, so have capability to sail far to the free ocean, if capable fisherman can operate until Indonesia EEZ waters.
- (6). Higher fisherman amount and fleet compare to Java Sea support powers, meanwhile in South Java is in contrary :
  - Need to allocated with organize fishing fleet structurization: Certain catch unit that sized relative small exchange with fish catch unit that able to sail farther,
  - Need to distract kind of fishing unit to decrease fishing pressure to Java Sea,
  - Ballance management must applied.
- (6). Need to prevent the local origine income (*PAD*) decrease where the ship comes from, for Java Island big ships that operate in outside of Java Sea which landed also its catch product in nearest landing place or nearest market through cooperation manage or link between *PPI* or *PP* that one to another. Also prevent social jealousy or even between region conflict.



- (7). Fish ship licencing need to observe back appropriate to each side authority, in this case good coordination are needed.
- Licencing regulation are there and clear, it is still able to simplify again?.
- (8). For handling fisherman density in North Java:
- Do fisherman transmigration, also fisherman human resources arrangement, like local transmigration to South Java
  - Fisherman transmigration applied regulation: capture fisheries market still high like in the fisherman origin place. Many ways to create market in those regions:
    - \* for example with retain catch product with suitable price, and then distributed to higher market or interisland (interinsular);
    - \* making fish processing factory to retain catch product and distributed to others island or export.
- (9). Need exact handling to catch product production in a integrated manner since from above the ship until to consumer hands. To expected with a Good Handling Practice (Prosedur Operational Standar) that already there can applied well in *TPI* (fish auction hall) that support by tools and support facility that suitable, so quality worthiness of catch product and price can be guaranteed if auction through *TPI*.
- (10). In handling catch product that landed, need to do:
- a. Clean water supplying that quite enough and spread evenly on every fishing port and achievable price by fisherman buy power. Besides tools and others support facilities need to provide to guarantee fastest and exact catch product handling that sanitizer.
  - b. Training must keep continue doing again through illumination, education, exercise, demonstration and dissemination practise clue of good fish handling. Fisherman awareness about clean importance in life and environment need to increase.
  - c. Techniques studies and growth, equipment and sanitation in handling catch product need to increase with consider condition and fisherman corporation scale capability that exist and also it's applied.
- (11). Few things that need to fixed for increasing traditional process fish quality in Java Island are:
- a. Clean water supplying;
  - b. Salt;
  - c. Processing place;
  - d. Drying tools;
  - e. Processing unit;
  - f. Increase processor capability about processing technique and corporation.
- (12). In able to keep preserve and even increase trade volume of Java Island fisheries product (and Indonesia). Efforts that needed in able to keep preserve and even increase trade volume of Java Island fisheries product (and Indonesia) are:
- a. Increasing service treatment from various facilities that there suitable with International standard requirement.



- b. Ease in banking service treatment; that expected can be online so trade transaction of local or export fisheries product can be easier.
- (13). Strive for decreasing IUU fishing and exploit fishing port role in Java Sea waters region in effort to decreasing IUU fishing or in effort carry out sea safety. For that should be done:
- a. Monitoring to illegal fishing that work by Indonesia fisherman or even foreign fisherman, need stricter more; mainly as connect with fisheries resources recovery effort in Java Sea region that already over fishing,
  - b. Management centres (to) illegal fishing activity thus has landing base around Java Sea waters that near with data management centres.
  - c. Fishing port in Java Sea waters region can be functionalize as data management centre to illegal fishing and as data management centre of unregulated activities and unreported fishing.
- Therefore fishing port infrastructure in Java Sea waters region has vital role in effort to decrease IUU fishing or in the effort to carry out sea safety.
- (14). With has many built *PP/PPI* in Java Island, can be sure that those regions can be reliable. Therefore it is need to make fishing port as one of coastal region economy growth centre, so need to do: effort in exploit EEZ fish resources potency of Indian Ocean that potency is still huge; that also mean in economically digging big economy growth that will able to give big benefits for state and community:
- (15). As connection with ASEAN free market prevail or AFTA in 2003 and APEC cooperation, where Indonesia inside of it, so it is make Indonesia must active in prevailed and applied. Each areas demand to find new break-through in pushing local economy growth.
- (16). Global growth has driven Indonesia to ratification GATT/WTO contract, AFTA commitment and APEC agreement, and further more in applied that contract/commitment/agreement. Need variety bilateral economic cooperation or even multilateral and also regional economic cooperation to apply GATT/WTO contract, AFTA commitment and APEC agreement.
- (17). Result incapable of new invest for Java Sea, so growth that can be done are:
- a. Exchange/renewed invest that already worn out.
  - b. New invest done to exploit fishing ground outside Java Sea.
  - c. Fishing activity in Java Sea should be decrease for temporary so production volume from fishing ground around will be decrease.
  - d. Linked economic activity with fisheries commodity trade (local or even export) must keep control so not decrease, because those trade activity raw materials or raw material for fish processing industry activity can supply from others region outside Java Sea fishing ground .
- (18). As connection with providing quite a lot of *PP/PPI* in Java Island, so exact step that must done by all involve stake holder in Java Island capture fisheries sector :
- a. Preserving various infrastructure facilities that already have so big invest that already spend can keep continue giving benefits to all community, especially fisheries community.



- b. Preserving and growing servicing system that already done until now, mainly to servicing system of fulfil all needs in fishing operation requirement, servicing system of fisheries product export and servicing system on fulfil invest budget.
  - c. Keep manage infrastructure that already have in professional way, in understanding that financial management of those infrastructure facilities can give bigger profits level that big also for community.
- (19). As connection with making fishing port as one of coastal area economic growth centre, so need to do:
- a. Always grow supporting institution functions to succeed of reached rapid economy growth.
    - Institutional that very supporting to succeed of reached those rapid economy growth are cooperation (Fisheries Cooperation/*Koperasi Mina*).
    - With well function of cooperation, so trade transaction of fisheries primary product or even secondary products, tertiary etc. will much involve local community; therefore hope local community economic condition can picked up. With those kind condition hope stability in economic can go on well.
- (20). As connection with effort of exploit EEZ region fish resources of Indian Ocean that still has big economic potency, so need to do:
- a. Bring out political will from government. Indians Ocean economic exploitation effort only waits for political will from government.
  - b. Expect fishing port infrastructure that locates in south coastal of Java Island can have quality increasing.
  - c. Others infrastructure condition like: land connections way, air connections way, clean water infrastructure and telecommunication way still need optimally.
  - d. Infrastructure of fisheries product processing industry, still need an increase.
  - e. For regions that has south coastal of Java Island demand to open those region economy; that still feel not make as economic growth centre.
  - f. Remembered of Java South Coast (*pansela*) fisherman amount that very less compare to Java North Coast (*pantura*), so in Java South Coast growth frame, need consider to use half Java North Coast fisherman to develop Java South Coast with:
    - Do moving in local transmigration form half of Java North Coast fisherman to Java South Coast; and or,
    - Without any moving in local transmigration form, but in form of andon fisherman (temporary stayed);
 Both work with first adaptive training give eases in having fishing unit and work capital, and etc.
- (21). Remembered market potency, capture fisheries capability, provide infrastructure and tools that enough and more suitable in Java Island compare outside of Java region, so in the reality nowadays Java Island has grown become big capture fisheries growth centre in Indonesia. Meanwhile in others regions outside of Java



(East Indonesia area: South Celebes, North Celebes, and etc.; West Borneo, North Sumatra, Riau, and etc.) that potential to become capture fisheries growth centre that still need "push" and effort to be more grown.

- (22). As "polities", "big" Centre of Java Island capture fisheries growth has obligation to be more active in pushing and trying growth of growth centre outside Java. Main keys are grown local market (increasing eat fish awareness, fish ability/buy power, increase citizens amount through transmigration, creating and strengthening marketing link centre-local, and etc.) and export market (ease export, creating and strengthening international marketing link, and etc.).

#### 4. Result And Suggestion

- (1). Capture fisheries activity in Java Island still dominate Indonesia capture fisheries and ahead will have startegic role in Indonesia marine and fisheries developing.
- (2). For more increasing Java Island capture fisheries (and Indonesia) that more competitive, need to do:
  - a. To study fish resources stock in periodically,
  - b. Increasing Java Island capture fisheries capability in various aspect so more able to reach farther fishing ground (EEZ Indonesia), include inside is increasing fishing unit capability and human resources in a integrated manner.
  - c. Increasing catch product quality and applied quality handling standard that effective and efficient .
  - d. Utilization of *PP/PPI* that exist to be grown in it's activity; al. As connection with increasing monitoring capabillity to handle illegal fishing.
  - e. Increasing capability in dealing national and global challenge in fisheries field.
- (3). In distinct need to rearrange fishing fleet structure, mainly in Java Island, with increasing or changing amounting of catch fleet with bigger catch fleet and have faether reaching area, closed catch invest in Java Sea; and do capture fisheries growth in South waters of Java.
- (4). Java Island capture fisheries has an obligation more active manner to support and to strive for growth centres development in Java outside. Main keys are expand local market and export market.

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## Enclosure

**Table-1** Potency, Production and Fish Resources Exploitation in Java Island in 1997

Fish Kinds Group	Evenly Potency (ton)	Production (ton/year)	Exploitation Level (%)
1. Big Pelagic			
1.1. <i>Tongkol</i> /Eastern litle tunas	29 400	33 470	114.0
1.2. <i>Tenggiri</i> /Narrow barred	25 000	11 890	46.5
2. Small Pelagic (Data from Kangean region)	340 000	442 900	130.0
3. Demersal Fish	451 000	214 700	47.6
4. Shrimp			
4.1. Peneid	10 800	11 100	102.0
4.2. Coral	500	125	25.0
5. Squid	5 042	5 099	101.0
	<b>861 742</b>	<b>719 284</b>	

Source: Widodo, J. 1998.

**Table -2.** Evenly Potency, Production and Exploitation Level of Fish resources in Indian Ocean in 1997

Kinds of Fish	Evenly Potency (ton)	Production (ton/year)	Exploitation Level (%)
1. Big Pelagic			
1.1. <i>Tunal</i> /Tunas	21 437	10 026	46.0
1.2. <i>Cakalang</i> /Skipjack tuna	24 870	6 552	26.0
1.3. <i>Tongkol</i> / Eastern litle tunas	17 876	8 044	45.0
1.4. <i>Tenggiri</i> / Narrow barred	9 910	1 097	11.0
2. Small Pelagic			
2.1. Middle South Java	45 900	28 825	63.0
2.2. EEZ South Java	250 835	-	-
3. Demersal Fish	451 000	214 700	47.6
All Indian Ocean	<b>135 000</b>	<b>102 000</b>	75.0
	<b>492 482</b>	<b>156 544</b>	
		<b>151 087*</b>	

Source: Widodo, J., dkk. 1998.

\* Indonesia Fisheries Statistic 1998/2000



**Table -3 Evenly Potency, Production and Exploitation Level of Fish resources in Java Sea and Indian Ocean in 2001**

Fish Kinds Group	Potency (1000 ton/year)		Production 2001 (1000 ton/year)		Exploitation Level (%)	
	Java Sea	Indian Ocean	Java Sea	Indian Ocean	Java Sea	Indian Ocean
1. Big Pelagic ( <i>tuna, cakalang, tongkol</i> )	55	309.01	137.82	188.28	251% (?)	61%
2. Small Pelagic	272	421.26	507.53	264.56	187%	63%
3. Demersal	300.16	108.1	334.92	134.83	112%	125%
4. Coral Fish	7.6	10.3	48.24	19.42	635% (?)	189%
5. Lobster	0.4	1.28	0.93	0.16	233% (?)	13%
6. Shrimp	9.12	8.56	52.86	10.24	580% (?)	120%
7. Squid	4.03	3	12.11	6.29	300% (?)	210% (?)



**Table -4 Fishing Activities in Java Island in 2001**

Items	Amount in North Java	Amount in South Java	Amount in Java Island	Amount in Indonesia	Percentage to Indonesia (%)	Percentage in North Java (%)	Percentage in South Java (%)
1. Fisherman (person)	690 791	188 569	879 360	2 562 945	34.3%	78.6	21.4
2. Marine Fishing Etablissement	81 062	20 960	102 022	514 291	19.8%	79.5	20.5
3. Fleet (unit):							
Non Powered Boat	14 661	6 174	20 835	241 714	8.6%	70.4	29.6
Ourboard Motor	51 975	11 499	63 474	120 054	52.9%	81.9	18.1
Inboard Motor	6 928	1 714	8 642	106 753	8.1%	80.2	19.8
<b>Total</b>	<b>73 564</b>	<b>19 387</b>	<b>92 951</b>	<b>468 521</b>	<b>19.8%</b>	<b>79.1</b>	<b>20.9</b>
4. Catch Unit :							
<b>Total (unit)</b>	<b>114 592</b>	<b>51 672</b>	<b>166 264</b>	<b>829 459</b>	<b>20.0%</b>	<b>68.9</b>	<b>31.1</b>
Dominant kinds	payang, trammel net, gillnet, trap	fishhook, trap, gillnet	-	-	-	-	-
5. Production that Landed (ton)	812 468	116 604	929 072	3 966 480	23.4%	87.4	12.6
6. Production Value (Rp millions)	3 687 701	493 850	4 181 551	22 154 236	18.9%	88.2	11.8
7. Dominant Fish Kinds	scads, fringescale sardinella, Indian mackerel, eastern litle tunas, pony fish	indian oil sardinella, scads, eastern litle tunas, tunas, hairtails	-	-	-	-	-
8. Fishing Ground	Java Sea, Natuna Sea-West, West Borneo, Maccassar Straits, South Celebes	Java South Coast Waters	-	-	-	-	-