VI. DISCUSSION

Economically, mangroves provide about US$10,000 per ha per year, equating to a global total of more than US$1.6 billions per year (Diop, 2003, Dixon (1989) states the value of a complete mangrove ecosystem to be in the range of US$500 to US$5,550 per hectare per year, the minimum valuation of a loss when mangroves are converted to other land use forms and White and Cruz-Trinidad (1998) estimated the value of mangrove use US$600 per hectare per year as the acceptable economic toll to indicate what is lost if mangroves are converted to other uses. In Muara Sabak Total Economic Value of Mangrove is Rp1,020,881,739 per hectare, in this case fishing activities for develop of floating port in Muara Sabak have been land clearing of about 40.5 Ha, so that economic value of mangrove loss is about Rp40,578,303,648. According to International Petroleum Industry Environmental Conservation Association (IPGECA, 2001) the main impact factors to consider in building gas pipeline is: project layout and disturbance of potentially sensitive environments and risk of soil and water contamination.

The number of fisherman in Muara Sabak not only from this area but also from another sub district more than 3000 fisherman operated in this area (Tanjabtim Marine Fisheries Office, 2005). In this case lost of earning of local fisherman in Muara Sabak area especially in Simbur Naik village that Floating port exist is about 1068 fisherman, Total Revenue of fish in Muara Sabak is Rp68,843,595,685 or Rp286,677,979 per person, and so that the value of loss of earning fisherman is about Rp73,524,960,191,587 per year.

The Benefit and Cost Ratio (BCR) is >1.0 or net present value of benefits > 0, the project is considered economically efficient. The greater the net present value of benefits, the greater the economic returns to society. Benefit Cost Ratio (BCR) of fishery biggest than Floating Port, for develop fishery that the most of artisanal fishery with the limited capital, technology, etc, have not bargaining position power in the development, compare petroleum activities. These activities are importance; it can be seen from the contribution of fishery sector for Regional Gross Domestic Product of Tanjabtim Regency. It was the second largest after mining sector, contribution of fishery sector for Regional Gross Domestic Product of Tanjabtim Regency. It was the second largest after mining sector. Below we can see in figure 13.
Figure 13. Sector Contribution to GRDP in Tanjung Jabung Timur Regency
Sorce: Tanjabtim in Figure 2005

Beside that Tanjung Jabung Timur regency receipt of Oil and gas Sharing Fund biggest than another regencies in Jambi Province just like show in figure 14 below

Figure 14. Oil and Gas Sharing Fund of Tanjung Jabung Timur Regency
Sorce: Tanjabtim in Figure 2005

In the other hand, Share of oil and gas benefit in Tanjung Jabung Timur didn’t relevant if we compare the benefit for Central Government is about 82 percent (Rp1,5 Trilyon) Company is about 16 % (195.6 Billion) and local government is about 2 % (Rp31.1 Billion) in 2004 as show in figure 15 below
Oil and Gas Exploitation in Jambi Province didn't have production added value, because crude oil processing in Plaju (South Sumatra Province), where 80 percent of crude oil processing in the Plaju Refinery came from Jambi Province. In this case South Sumatra Oil and gas fund Sharing (Dana Bagi Hasil Migas) bigger than Jambi Province, in 2004 South Sumatra recipe Oil and gas fund Sharing Rp915, 586,602,388 and Jambi Province only recipe Rp106, 729,089,109 (Figure 16)

Figure 15. Oil and Gas Sharing Fund of Jambi Province and South Sumatra Province
Source : BAPPENAS, 2005

Regional Spatial Planning of Jambi province, divided by three development purpose, there are: 1) Development for growth economic increase divided by four growth pole development (western part, middle part, eastern part and city part). Beside that created the strategic zone as engine of agent development (Jambi Province coastal...
2. Development for Sustainable, Jambi Province have seven bioregion, there are:
1) in the forest ecosystem is Kerinci Seblat National Park; 2) in the lowland ecosystem are Bukit Tigapuluh National Park, Bukit duabelas National Park; 3) in the wetland ecosystem are Berbak National park, Peat land conservation area; 4) in the coastal area is the mangrove conservation area; 3) Development for Equity, Jambi Province have Center of Production zone, Agropolitan zone. (The map of Conservation area see in Appendix 2)

The equity of development is the one important thing to develop local community, because between Economic growth increasing and sustainability, some of community household depend on clean environment, such as fisherman that need the good water quality and the farmer that depend on good quality soil and water. According to Lai and Meng 1985, untreated crude oil was more toxic than dispersed crude to mangrove beaches. Untreated oil in the upper sediments required a longer time to weather and depurate than chemically dispersed oil.

Economic growth increasing activities have negative impact to environment due to the threat for sustainable development Relation on the research and the amendment of Oil and Gas Law the activities of Oil and gas must be increase community income and sustain environment. Since three year ago PetroChina Company had Community Development for local community as shown in figure 17 below

**Figure 17** Community Development Fund of PetroChina for Local community

Actually Community Development Fund (CDF) not only from PT PetroChina but also from PEMASINA, PT POSINDO, TELKOM, the big Private and many Revolving Central Government (Marine and Fisheries Ministry); from Province throw a Small scale business Credit program (KUPEM) budgeted every
years is for 5 billion since 2001, where the Regent as the Guaranteed of Credit because the most of small scale are not bankable. In Implementation, the CDP distribution not concentration and transparency, so that this programs unsustainable.

According to Campbell, 1999, the Sustainable Livelihood Approach can support development of alternative strategies for people wishing to leave the fishery. However, this is more likely to be achieved by improving their human and financial assets, livelihood strategies alternative will also be important. There are five types of capital assets: human, social, natural, physical, and financial.

The concept above had been done in Jambi since 2002 with built company PT Jambi Info Trade Center (PT.JITC), it share holder between Province Government, Regencies, big private and community. It develops for help marketing of farmer product, transfer of technology. Beside that for Transfer of technology the farmer had built Entrepreneur of Degree (budget in APBD, recruitment every year 20 people that training in the big private and to be actor of development in village).

Marine and fishery of Tanjung Jabung Timur Regency development have been done research result as follow:

JICA, 1992 said The most of Tanjung Jabung Timur Capture fisheries dominated traditional fishing gear including tidal traps (togok, gombang) and mini trawl (lamparan, pasar and dogol) in the near shore, recent catch of shrim/fish has been stagnating and average size of shrimp/fish has become smaller. Fishing activities in near shore which may lead to resources depression, and to control coastal fisheries activities thought adoption of appropriate integrated resources management plant, and it is expected to upgrade small-scale fisherman and promote the export of fishery product with creation of new fishing ground for high valued demersal fish and conversion into brackish water shrimp.

Riswandi (2005) said, the priority of marine and fisheries development in Tanjung Jabung Timur Regency are:

a) Capture Fisheries, where the Benefit cost value (BC) 1,542.
b) Increasing harvest quality, Benefit cost value 1,410
c) Shrimp farming, Benefit cost value 0,821
d) Develop of hatchery with Benefit cost value 0,728
e) Develop of Marine Culture, Benefit cost value 0,611.
3. Zarhedin, 2005 said this area should be develop fishing, especially increasing fishing gear and fishery technology and Shrimp farming, fish pond in small scale.

4. Tan, 2002 said for optimal of resources utilization with purpose social welfare in Jambi Province "The Integrated Farming System" model is suitable to implement.

Based on the research result above the strategic livelihood for artisanal fishery gets an impact to floating port development not only in fishing activities but also another livelihood, where one fisherman utilization another resources in there area, as

The Primary Livelihood is fishing capturing. According to Marine and fishery Affair of Jambi Province, 2001, utilization of fishing capture are; 1) Big pelagic utilization is about 53.23 percent; 2) Small pelagic is 33.07 percent; 3) Demersal fish is about 16.34 % and 4) shrimp, lobster is more than 100 percent. In this case in develop of fishing capture in this area should be develop of modern fishing gear and fishing boat to remove fishing ground that far from coastal area.

The secondary livelihood are crab culture, mangrove forest utilization (Honey exploitation), handicraft and utilization their garden for horticulture and medicine plant. In this case the fisherman can empowerment their families for this business.

If one of fisherman household has more than one products, their cash-flow every year can guarantee and some day the fisherman will be bankable (Table 23) the one important thing is their Culture of work increasing because every day they have activities because the fishermen in this area only fishing eight mount in one year, they have spent five four mount a year.

Table 23 Cash-Flow of Fisherman livelihood

<table>
<thead>
<tr>
<th>No</th>
<th>Livelihoods</th>
<th>Months 1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Fishing</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
</tr>
<tr>
<td>2</td>
<td>Crab culture</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
</tr>
<tr>
<td>3</td>
<td>Honey exploitation</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
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<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
</tr>
<tr>
<td>4</td>
<td>Handicraft</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
</tr>
<tr>
<td>5</td>
<td>Horticulture</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
<td>Rp</td>
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<td>Rp</td>
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<td>Rp</td>
<td>Rp</td>
</tr>
</tbody>
</table>
To support livelihood strategic of fisherman not only responsibility of company but also local government should be create conducive clime for fisherman, the point of strategy is supporting of capital asset as follow in the Table 24 below.

<table>
<thead>
<tr>
<th>Capital Development</th>
<th>Stake holder Responsibility</th>
<th>Funding Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Human skills, knowledge, ability to work and good health diet</td>
<td>Government Jambi Info Trade Centre (JITC) company, University</td>
<td>Regional Development Province (APBN), Regencies (APBD), PT JITC</td>
</tr>
<tr>
<td>Natural Biodiversity, the mangroves protected and rehabilitated can increase the benefits from natural capital. Reducing the conflict between different fishing groups.</td>
<td>Government Company (CDF) NGO</td>
<td>Regional Development Province (APBN), Regencies (APBD), CDF of Petro China, Non Budgeter Fund</td>
</tr>
<tr>
<td>Social supporting and using the positive networks and relationships</td>
<td>Government PT JITC University</td>
<td>Regional Development Province (APBN), Regencies (APBD)</td>
</tr>
<tr>
<td>Physical infrastructure harbors and jettries, fish landing areas, gear stores, smoking kilns, and ice plants.</td>
<td>Government Company (CDF)</td>
<td>Regional Development Province (APBD), Regencies (APBD), APBN, Petro China, Non Budgeter Fund</td>
</tr>
<tr>
<td>Financial Improving access to credit, supporting the development of savings and loan groups, developing business management skills, and increasing access to natural capital that can be exchanged for financial capital.</td>
<td>Government Company (CDF) Finance Institutional (BPR, BRI, etc) and Credit Finance Guaranteed (Lembaga Penjamin Kredit)</td>
<td>Regional Development Province (APBD), Regencies (APBD), PetroChina, APBN, Non Budgeter finance.</td>
</tr>
</tbody>
</table>

Sources: Modified by SLA

To combine the concept should be forming independent management in the field. Other organization that consist of Field manager with five division (Division of Infrastructure, Marketing, Technology, Finance and Natural Resources). To create the website, where the members are: Central, Province and Regency Company, University and Community for program coordination. The field
VII CONCLUSION AND RECOMMENDATION

7.1 CONCLUSION

There are two Resource Damage caused by Floating Port Development in in Muara Sabak; 1) mangrove cutting for piping from Muara Sabak until Simbur Naik Village is about 40.5 Km², where the value of mangrove in Muara Sabak per hectare is Rp1,220,681,739.05 so that the value of resource damage is about Rp31,337,610,431.525; 2) Resource damage the fishery is about Rp24,244,763,194.50 per year due to change of productivity.

There are about 314 local fishermen lost their earning because their fishing ground are limited by the development of floating port. Since a fisherman's earning is about Rp286,977,979 per year, the total lost is about Rp90,016,885,343.

In order to maintain the local fisherman's livelihood in this area, a strategic action plan should be carried out, i.e: 1) develop fishing technology for fishermen in order they can fish in other fishing grounds far from their village.; 2) Empowerment the family members to increase income from other sources.

7.2 RECOMMENDATION

Based on the conclusion above, it is recommended as follows:

The Local Government should pay more attention to the renewable resources, because 96 percent of the local community depend on the resources.

Community Development Fund should be distributed to support the emprovement of the community welfare this fund should be managed professional by our independent institution on the right place and purpose. So that it will the sustainable of their livelihood and it management should be Independent and managed by professionally by an independent institution.

Local Government should well understand the resources value in their region. In this case a study of natural resources values both for local government, central government and worldwide should be given high priority.

Local government should pay more attention to create conducive condition for development of five capitals (human capital, social capital, natural capital, physical capital and financial capital). It should be supported by the private company that can