

**UNDERSTANDING LIVELIHOODS
DEPENDENT ON INLAND FISHERIES
IN BANGLADESH AND
SOUTHEAST ASIA
(DFID/FMSP Project R8118)**



**VIETNAM
SUMMARY REPORT**

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1. INTRODUCTION

The Department for International Development (DFID) of the United Kingdom has identified fisheries as an entry point for its strategic policy of reducing by 50% the number in extreme poverty by 2015 – a challenge of the 21st century. The fisheries sector can have a significant impact on the number of those in poverty in countries such as Bangladesh where there is a significant inland aquatic resource base and a considerable number of poor people who are dependent on these resources, and who are disproportionately disadvantaged due to loss and degradation of habitat, lack of management or mismanagement of the resource or inappropriate institutional and policy frameworks.

Inland fisheries are a potential entry point through which the livelihoods of poor people can be improved in the South and Southeast Asian countries of Bangladesh, Cambodia, Vietnam and Laos, where there are important inland fisheries resources and a considerable portion of the population are dependent on inland capture fisheries for their livelihoods. Before taking any measure to improve the livelihoods of poor people dependent on inland fisheries, a better understanding of the resource status and management regimes, and of the users' livelihood status, needs, problems and constraints is needed. In the past there has been more emphasis on the resources and less on the issues affecting poor people dependent on them. In view of the above a research project entitled "Understanding Livelihoods Dependent on Inland Fisheries in Bangladesh and SE Asia" has been undertaken by WorldFish Center in collaboration with Government/NGOs/Universities in Bangladesh, Cambodia, Laos and Vietnam. In Vietnam Can Tho University and An Giang University are the local collaborator or partner organizations. The project period is from February 2002 to May 2003.

The project aimed to characterise the poor, identify their dependence upon aquatic resources, the nature and status of those resources, and their vulnerabilities in relation to loss or mismanagement. Constraints and possible research priorities have been identified through consultations with poor fishers and other aquatic resource users, and with other organizations. Fisheries resource status has been summarized.

The national studies have (i) reviewed the existing literature and conducted stakeholder discussions resulting in a country status report, and (ii) conducted Participatory Rural Appraisals (PRAs) with fisheries stakeholders to fill information gaps and obtain opinions resulting in a country PRA report. This

country summary report is prepared on the basis of those two reports.

2. POVERTY STATUS

Vietnam is among the most densely populated countries in Southeast Asia. The highest densities occur in the south (especially within the delta of the Mekong River) and the north (Red River delta) which represent the country's most important agricultural areas. The total population of Vietnam, by mid 2001 was 78.7 million, with an average annual growth (from 1995 to 2001) of 1.5%. Economic development has accelerated in recent years. The average annual labour force growth (from 1995 to 2001) is 1.7% (World Bank, 2002). Almost all freshwater areas are heavily exploited for fisheries. However, there are still a high percentage of people (32% of the total population) living below the national poverty level (World Bank, 2002). Life expectancy at birth is 69 years, and infant mortality is 37 per 1000 live births. Malnutrition affects 34% of all children under 5 years old. Although many are living close to water resources, only 56% of the total population have access to an improved domestic water system. The illiteracy rate is 6% (World Bank, 2002). The percentages of rural population with access to clean water and electricity are as low as 17% and 48% respectively, but 25% of households own a television set.

Although Vietnam recorded great achievements in bringing down the incidence of poverty, it is yet not on a solid ground in the struggle against hunger and poverty. The income of a large proportion of the population lies just above the poverty line, and even a small adjustment in the position of the line will put them below the poverty line.

2.1 Agricultural growth and options

Agriculture comprises 23.6% of the total national Gross Domestic Product (GDP) (US\$ 32.7 billions) in 2001, with an average annual growth of 2.8%. The growth of agricultural production was relatively high and broad based at 5.6% per annum during the 1991-2000 period. Per capita food production increased from 303 kg to 444 kg in 2000. Vietnam has become self sufficient in food with satisfactory food reserve and now exports over three million tons of food each year. Revenue from agriculture exports nearly quadrupled from US\$ 1 billion in 1990 to over 4.3 billion in 2000. The structure of agriculture production in many regions has transformed with increasing efficiency per unit area used; and the rapid growth of aquaculture is especially noteworthy. The rural

economy is more diversified; many large-scale agriculture production areas with close links to agro-processing have been established. The traditional craft industries have been restored and farm-based production has been expanding rapidly.

2.2 Poverty indicators and geographical distribution of poverty

The percentages of poor and hungry households in Vietnam remain relatively high. According to Living Standards Measurement Survey (DFID), Vietnam's poverty incidence was over 37% in 1998, and is estimated at about 32% in 2000. For this survey the lower line used was based on the food poverty line (average daily intake of 2,100 Kcal), or hungry poverty line (total consumption of 25kg/person/month in the urban areas, 20kg in the rural low/midland and 15kg in highlands) and the higher line was the total poverty line (costs of non-food to the minimum expenditure). In 1993 expenditure based total poverty line was 1.16 million VND (Vietnamese Dong) per annum per person (55% higher than the food poverty line) and in 1998 it was 1.79 million VND (39% higher than the food poverty line).

The poverty indicators explained by the Participatory Poverty Analysis synthesis report (1999) (Table 1), are similar to the poverty analysis made by the participants of Participatory Rural Appraisal (PRA) in the present study (Table 2). The poor lack education and skills. They cannot take loan from the bank as they do not have land. They borrow money from moneylenders at high interest rates, most of the time they cannot repay those loans and have to sell their assets to pay back, and sometimes migrate to the city in search of job. As they are constantly hungry and psychologically stressed, they are physically weak also. Most of the fishers changed their livelihoods strategy due to declining fish catches and low income from fisheries. Now they fish full time in the peak period and work as wage labourers during the lean period.

Table 1: Indicators for wealth ranking

Endowment of natural, financial and material	Chronically hungry, economic asset endowments are constrained, household economies are not diversified, vulnerable to poor harvest, few options for
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capital	generating a stable cash income, indebtedness and high level of psychological stress, possess small houses with temporary roof
Endowment of human capital	Having many children, low level of education
Vulnerability crises and shocks	Illness, failure of an investment, loss of livestock, loss of crop
Cultural and physical isolation	Ethnicity, remote habitation
Low level of social capital	Migration, no permanent registration, limited social connection

Table 2: Poverty indicators mentioned by the PRA participants

Indicators	Rich	Average	Poor
Dwelling construction materials	Concrete	Wood	Straw/leaves
Income	> 1 million VND	> 5 million VND more than 1 million	<5million VND
Property	Table, chair, chest, colour TV, radio, Japanese motorcycle, engine boat, other household assets, savings etc.	Some furniture, Black and White TV, radio, Chinese motorcycle etc.	No furniture only bamboo bed, bicycle
Education	Higher education	Mostly up to primary level but some up to high school	Illiterate or primary school
Income source	Variable and some stable	Employed or self employed	Fishing and wage labor
Land	>1 ha	0.5 ha	0.1-0.3ha
Many children in the household	4-5	5-7	<7

The percentages of poor and hungry households in Vietnam remain relatively high. Poverty is widespread but concentrated in rural areas especially in northwest and in remote and isolated mountainous areas (Table 3). According to DFID (1998), 80% of the total population and 90% of the poor live in rural areas. Besides the poverty rate is extremely high among ethnic minority groups. Poverty has declined in seven different regions, but at different rates. Three regions still show a very high poverty level: Northwest (59%), North central coast (48%) and Central Highlands (52%).

Table 3: Estimated poverty magnitude and incidence of poverty in 2001.

	Number of poor households (million)	As % of total household in the area	As % of total poor household in the country
Northwest region	0.146	33.9	5.2
Northeast region	0.511	22.3	18.2
Red River Delta	0.337	9.8	12.0
North Central region	0.54	25.6	19.8

Central Coastal region	0.389	22.4	1.9
Central Highlands	0.190	24.9	6.8
Southeast Region	0.183	8.9	6.6
Mekong River Delta	0.490	14.4	17.5
Total	2.8	17.2	100
Rural	2.5	19.7	90.5
Mountainous areas	0.785	31.3	28.0
Plain land	1.75	16.9	62.5
Urban	0.265	7.8	9.5

Source: National programme on Poverty Reduction (from CPRGS)

2.3 Land holding

Poor people lack access to resources, especially land. Land holding has a strong relationship with the poverty. Although government distribution of land has a flavour of equity, the poor without

any inheritance of assets tend to sell land or lose land to moneylenders or banks (due to mortgaging) during crisis periods. Land holding size varies by region. Although the Mekong Delta shows an increasing trend in landlessness (Table 4), it is one of the wealthier regions according to other indicators. However, the incidence of increasing landlessness may be due to families having many children and splitting paternal property. Poor people tend to sell their small amount of land and migrate to the city in search of work.

Table 4: Percentages of rural households with no land

Region	Percent households		Average farm size (m ²)
	1993	1998	
Northern Uplands	2.0	3.7	8890
Red River Delta	3.2	4.5	6491
North Central	3.8	7.7	5001
Central Coast	10.7	5.1	5180
Central Highlands	3.9	2.6	13746
Southeast Region	21.3	28.3	13712
Mekong River Delta	16.9	21.3	10650
All Vietnam	8.2	10.1	8148

Source: World Bank estimate based on VLSS93 and VLSS 98

3. FISHERIES RESOURCE STATUS AND IMPORTANCE

3.1 Fisheries issues

- The fishing gears used are more or less the same in all parts of Vietnam after 1975 because of migration of fishers from one province to another.
- The fish production has fallen gradually due to over-fishing or using some harmful gears such as electrical shock, small size mesh net, chemicals, explosives, etc.

- The natural areas for fish habitats or niches have been reduced due to expansion of areas under rice cultivation and intensification of farm activities.
- Almost all the freshwater productions were consumed in local market, and they are a major income source for poor people with small land holdings or no land.
- Sustainable production models such as VAC (rice, fish culture and animal husbandry), VACB (rice, fish culture and animal husbandry, and Biogas production) or rice-fish integrated farming system could increase the fish production for farmers
- Implementation of laws against use of harmful fishing methods such as electrical shock, chemicals, etc., is very weak.
- **Very limited effort has been taken to establish inland fish sanctuaries to conserve the valuable genetic resources and biodiversity.**

3.2 Geographical distribution of fishers

According to the figures in Table 5, the highest numbers of fishers are found in the Mekong Delta, the North Central Coast, South Central Coast and North East South. It is somewhat surprising that figures are so low for other areas, in particular the North West and Central Highlands. However this is perhaps symptomatic of inland fisheries, in which there may be a significant proportion of people who fish, but only a small proportion who regard themselves as ‘fishers’.

Table 5. Fisher households by region in 1990 and 1998.

Region	Number of fisher households in 1990	No of fisher households in 1998	Number of fishers in 1990	Number of fishers in 1998
Red River Delta	12 415	16 745	55 326	77 630
North East	5 621	7 635	26 804	37 270
North West*	147	174	648	1 068
North Central Coast	62 610	72 967	309 843	370 798
South Central Coast	49 213	63 783	260 947	335 099
Central Highlands **	247	409	1 336	2 260
North East South	37 720	52 594	201 424	285 232
Mekong Delta	60 677	87 645	314 802	448 564
Whole Country	228 650	301 952	1 171 130	1 557 921

* The majority of fishing households in the North West are in Hoa Binh (100 in 1998), with 60 in Son La and 14 in Lai Chau.

** Most fishing households in Central Highlands in 1998 are in Dac Lac (403).
Source: GSO (1999)

3.3 Fisheries significance

Capture fisheries remain of particular importance in the livelihoods of poorer people. Vietnam Living Standard Study data (1993 and 1998) on employment indicates that the poor spend more time on capture fisheries (in rivers, lakes and coastal areas) than on culture in all regions of Vietnam except the South Central Coast. There are several possible explanations for this trend in the South Central Coast. The decline in near artisanal shore fisheries is most pronounced in South Central Coast while at the same time the South Central Coast has the largest offshore fishery.

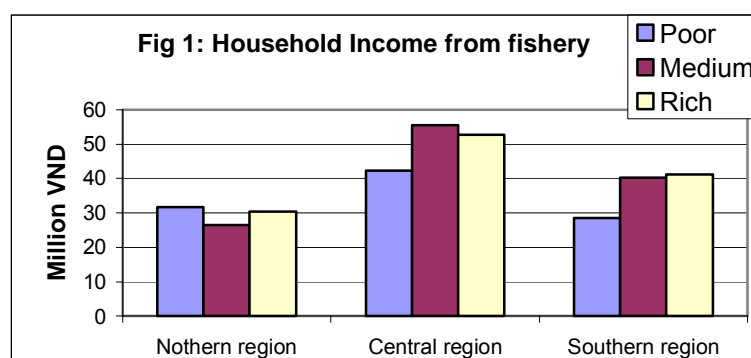
Based on a survey of three regions (the Northern Region, the Central Region, and the Southern Region) Carl Bro (1996) conclude that the majority of surveyed households are involved in some form of fisheries or aquaculture activity.

Capture fisheries remain of considerable importance for rural people, from poor to rich, in many parts of Vietnam, not only for full-time fishers, but significantly for households who combine fishing as a component of wider livelihood strategies (Table 6). As has been

Table 6. The fish productivity in rice-fields of Northern Vietnam.

Location	Area (ha)	Production (tons)	Productivity (ton/ha/year)
Bac Thai	62,243	4000	0.64
Tay Bac	29,830	3000	0.1
Bac Bo landscape	5,000	1,000	0.2

Source: Mai Dinh Yen (1991)



mentioned earlier, income statistics for such small-scale fisheries are very limited (Fig 1).

The role of inland capture fisheries is more clearly illustrated by case studies. In two studies of capture fishing and aquaculture in two provinces in Southern Vietnam (Tay Ninh province and Long An province) Nho and Guttman (1999a and 1999b) discuss the role of aquatic resources in the livelihoods according to economic status. The study of Tay Ninh province (1999a) indicates that most households are involved in some forms or activities of capture fisheries but that this is of even greater importance for poorer households Table 7.

Table 7. Proportion of households fishing by different income groups.

Income group	Proportion of households fishing
Very low income	88%
Low income	84%
Medium income	58%
High income	44%

Source: Nho and Guttman (1999a)

The PRA study revealed that traders earn more from fish trade than other types of fishery stakeholders

(Table 8). Full time fishers, reported to be the poorest of the poor, earn less as they do not have bigger and more efficient gears for fishing. Moreover, they have limited access to the floodplain fishery which is the most important for individual fishing grounds. Landowners like to fish in their own land during the peak fishing period. Moreover, due to dyke construction fish recruitment in the floodplain has decreased and the brood fish which breed in the floodplain environment tend to be prevented from moving into their breeding grounds. Even fishes which can get

inside the floodplain suffer from excessive water pollution from the agro-chemical use.

Table 8: Fisher incomes in 2002.

Stakeholder category	Total income/household /year (VN Dong)	Household size	Income/person/month (VN Dong)
Fulltime	5 000 000	6	69 444
Part time	6 000 000	6	83 333
Traders	9 400 000	7	111 905

Source: PRA – this study.

4. POLICIES AND INSTITUTIONS

The Vietnam Development Report 2000 “Attacking Poverty”, emphasises that each sector should design a program which contributes to poverty alleviation through contributing to three key pillars of poverty alleviation: (i) creating opportunity; (ii) ensuring equity, and (iii) reducing vulnerability.

A Sustainable Aquaculture for Poverty Alleviation (SAPA) strategy has been formulated by the Ministry of Fisheries (MOF) to contribute to the goal of poverty alleviation as part of the overall Government “Hunger Eradication and Poverty Alleviation“ strategy.

The purpose of the SAPA strategy is to enhance the livelihoods of poor and vulnerable people through aquaculture with the following outputs:

- Capacity of institutions strengthened, particularly local institutions and communities to understand and support the livelihood objectives of poor and vulnerable people who depend on or could benefit from aquaculture.
- Access improved for poor people to materials, information, financial and extension service and markets.
- Communication improved amongst stakeholders through awareness raising and knowledge sharing networking inter-sectoral and donor co-ordination introduction of participatory planning implementation monitoring and evaluation approaches and informing policy development.
- Environmentally friendly, low risk, low cost aquaculture technologies and management practices development and adopted.

Unfortunately there is no similar strategy for inland fisheries, reflecting the comparative neglect of this sector in the policy arena.

4.1 AGRICULTURAL REFORM

The transformation of the agricultural economy of Vietnam was influenced primarily by land reform policies during the last decades. In the early 1960s, land reform was the central

issue of peasant politics. The struggle for land was the engine of the Vietnam revolution during the American occupation. The economics of land was dramatically changed with the impact of the war. Peasants abandoned their lands in the upper Mekong delta. From 1958 to 1967, prices of land in the upper Mekong delta were reduced to half. Land although still an important factor of production was not so critical because of land surplus. Technology and other inputs such as seeds and fertilizers were the more critical factors of agricultural production.

In 1970, the “land for tiller” programme was launched where landlords were compensated for their land that would be transferred to the peasants (Kolko, 1985). This move reduced the opposition of the landlords to the land reform policy, which allowed them to retain up to 15 ha. Industrial crops and orchards were planted; and about 1.1 million ha of agricultural lands were transferred to the rural population - each peasant received 3 ha. Vietnam’s agricultural policy was directed primarily towards making the entire country self sufficient in food supply by implementing a socialist agricultural system based on collectivisation.

By 1981, the inherent problems with the system of collectivisation had become more apparent, for example the prohibition of private ownership and lack of long term security of land tenure led to a decline in investments and also served as a disincentive to increase production. Beginning in 1988, the tenure right of households to farm lands were secured for a long term (15 years) and from 1993 tenure rights have been extended to 20 years for annual croplands and 15 years for perennial croplands, renewable subject to existing laws.

In May 2002, Vietnam completed a Comprehensive Poverty Reduction and Growth Strategy (CPRGS) that seeks to translate the vision laid out in the Ten Year Socio-Economic Development Strategy into concrete actions (Government of Vietnam 2002). The CPRGS recognizes that despite the gains of the last decade, poverty remains widespread and deep. It also articulates clear targets through the Vietnam Development Goals. To attain those goals, both the level and pattern of growth in the next decade will be important.

This strategy argues that Vietnam may be entering a new phase of rapid economic

growth, like in the 1990s, after doi moi (a household oriented contract system). But the pattern of growth will very much depend on how three main challenges will be addressed:

1. Completion of the structural reform agenda. Fast progress in liberalizing trade will soon conflict with the slow restructuring of state-owned enterprises and state-owned commercial banks.
2. Keeping growth pro-poor, as in the 1990s. Integration with the world economy may widen the gap between urban and rural, skilled and unskilled. To complete its reform agenda, and improve education and health outcomes, Vietnam will need better governance.
3. The third challenge may be the most difficult of all. Despite the upbeat growth perspective for the coming years, Vietnam is at a crossroads. It may be successful in its attempt to become a market economy with a socialist orientation. The high growth, inclusive development and an overall good quality of government will then be its distinctive marks. Or it may fail to remove the obstacles in its reform path, let vested interests capture government transfers to offset their inefficiencies, and see an unhealthy relationship develop between enterprise and government officials. The key decision that will make the balance tilt in one direction or the other will be made over the next few years, reverting the process will be difficult. Whether Vietnam will deliver on its promise depends on those decisions.

4.2 Policies, Institutions and Practices

4.2.1 Agricultural change

After the war, collectivised production with teams using commune owned equipment was introduced from the north into the south but disregarded producer incentives and disrupted market mechanisms for the flow of inputs and outputs. The big change in policy from the post-war collectivised production system towards a household oriented contract system (the Doi Moi policy – or Renovation) lead to self sufficiency in rice in the mid 1980s.

Further reforms initiated in 1988 (long-term inheritable land leases, replacement of contract

system with fixed land tax, removing sale of produce to the state at low prices, privatisation of output markets, decentralisation of input supplies, and removal of food grain subsidies) strengthened producer incentives and led to further productivity increases. Vietnam is now the second to third largest exporter of rice (depends on year, after Thailand and USA). Traditional rice production systems in the Mekong delta in the mid 1970s produced 4 million tons, by the late 1980s 6 million tons, and now around 13 million tons, just under half of national output.

Cultivated area has increased by 0.6 million ha through forest clearance, irrigation and drainage. Moreover, the high price of shrimp has seen the emergence of so-called “shifting shrimp farming”. A farmer moves into a public mangrove forest, slashes down an area to form a shrimp pond and traps wild seed. The system depends on natural productivity. Profits are high but where mangrove areas are on potential acid sulphate soils, farms become unsustainable within 4 years. Farmers abandon the “farm” (or pond) and move to another location. The practice is hugely environmentally degrading, affecting coastal stability, land productivity, and local and offshore fisheries.

4.2.2 Government policy strategies for poverty elimination and sustainable livelihoods

As the development gap between urban and rural areas has increased during the transition towards a market economy, rural development has been given first priority in the Government’s current development strategy.

Ministry of Labour, Invalids and Social Affairs (MOLISA) began co-ordinating the Hunger Eradication and Poverty Reduction (HEPR) programme in 1992 as a part of a large focused effort to mobilise available resources by all Government sectors and Vietnamese people through formulating and implementing realistic programs to support the rural poor. One of the more remarkable interventions under HEPR is targeting the communes facing extreme difficulties with a project for socio-economic development in 1,715 remote and mountainous communes. This project has an innovative concept of transferring resources from the Government directly to the communes. During the first year of implementation in 1999, it absorbed two-thirds of the budget allocated to the HEPR programme and thus became flagship. Moreover the project was placed under the management of Ministry of Planning and Investment (MOPI) indicating the importance given to it by the Government.

Most recently a Comprehensive Poverty Reduction Strategy has been prepared. MOLISA provides the secretariat co-ordinating the National Multi-ministerial Coordination Committee. The goal is to put poverty reduction at the centre of most policies and programs in Vietnam as affirmed by President Tran Duc Luong at the United Nation Millennium Summit in New York. To implement this strategy different sector ministries, mass organisations and NGOs have been requested to prepare specific sector policies.

4.3 Fisheries and Wetland Problems and Trends, and Related Policy Issues

4.3.1 Problems and trends

In coastal areas the current use of aquatic resources is not sustainable. Exploitation pressure is increasing due to modernization of the fishing fleet (larger boats with better gear) and increasing coastal population density with its demand to maintain incomes through greater catches. The widespread use of illegal fishing methods also contributes to the degradation of the natural resource base.

The uncontrolled expansion of the brackish aquaculture sector into the coastal mangrove forest zone has led to depletion of the natural fishery stocks as the natural nursery grounds (mangrove forest area) have vanished. As shrimp culture is often based on natural shrimp recruitment, shrimp aquaculture yields have also been reduced, partly due to the depletion in the natural fishery stocks. The rapid conversion of mangrove forest into shrimp aquaculture has changed the entire ecosystem in the coastal area to such an extent that negative impacts have been experienced by the local community in terms of reduced fish catches and shrimp

disease outbreaks leading to harvest losses of up to 100%. The communities living in these regions are among the poorest in the Mekong Delta and therefore they have little or no other income opportunities than to cut the forest.

There is great concern about the direct discharge of effluents from factories in Mekong Delta provinces. Wastewater treatment systems seem to be non-existent in the production industry and the effluent discharge content ranges from organic waste to chemicals. The treatment of hospital wastewater is non-existent. Hospital effluent may carry waterborne pathogens that are endemic to humans and therefore represent a potential risk of epidemic outbreaks. Water contamination by pesticides was discovered recently in the rural areas of Can Tho Province. The problem will continue as long as pesticides are used in agricultural production. There is a need to inform people about the handling of pesticides (e.g. do not dilute them near your well).

Throughout the Lower Mekong Delta there are problems with acid sulphate soils. Acid sulphate soil or potential acid sulphate soil (PASS) is seen as a constraint to agricultural development. Exposure of PASS to air leads to oxidation of pyrite and the formation of sulphuric acid, which acidifies soil and water. The consequences of an acute pH reduction in aquaculture ponds in the early monsoon, by acidic surface water, can in severe cases cause an entire harvest failure. In less severe cases, the shrimp may just be stressed which makes them more susceptible to disease outbreaks. Growth of vegetation is inhibited by exposure to acidic conditions. Only a limited number of plant species are tolerant of low pH.

Sustainable management of the natural fisheries is needed. It is not sustainable to increase production by building a bigger fleet of larger boats that can simply go offshore. Measures to reduce exploitation of the coastal (near-shore) and inland fisheries are essential in order to allow the commercial species to reproduce and thereby maintain sustainable fishery stocks.

Increasing brackish aquaculture by increasing the area is not an optimal solution. At the moment the production of shrimp is extensive, yet the yields are far below (150 kg/ha/year) the yield of similar systems in other SE Asian countries (500-800 kg/ha/year). It would be more useful to introduce improved extensive or semi-intensive production systems. That would in theory increase production whilst keeping the area stable allowing for mangrove to be forested.

A number of illegal fishing methods are common in the inland fishery such as: electric fishing, fishing with mosquito nets, and chemical poisoning. These pose a direct threat to the suitability of the ecosystems because they are non-selective fishing methods.

In conclusion some of the issues that need to be addressed through legislation and policy provisions include:

- Fish production from natural sources is falling gradually due to over-fishing and use of damaging fishing methods such as electrical shock, nets with small mesh size, chemicals, and explosives. These damaging practices need to be prevented.
- Natural fish habitats and niches have been reduced in area by expanding the rice cultivation areas and intensifying farm activities.
- Almost all the freshwater production is consumed in local markets, this is a major income for the poor farmers with small landholding and the landless but is not considered in policies.
- It is necessary to develop and extend sustainable agriculture models such as VAC and rice-fish integrated farming systems. This can increase fish production and hence incomes of farmers.
- Establishing fish sanctuaries to protect valuable genetic resources.

4.3.2 Environment and fisheries policies

Vietnam is a socialist state, with a single party system. The country's history of resistance to foreign intervention has left a legacy of strong community values (and concern about poverty), and determination to maintain national control and direction of its policies.

Virtually all significant policy debate is conducted within the confines of government and party. Some policy issues include:

- The Environmental Law was pronounced in December 1993 and especially, the papers under the law on the Protection and Development of Aquatic Resources were promulgated on 25 April 1989 that has 29 points to prevent the damaged actions of fishers.
- The rules talk about the critical importance of maintaining good water quality, the size of the aquatic resources that can be harvested, and timing for catching.
- Using credit to help the fishers change to practices that are not damaging to aquatic resources, such as changing from fishing into cage culture in the rivers and lakes.

- Stocking fingerlings in rivers and lakes, for example grass carp and silver carp in the Red River - the impacts of such public stocking with exotic fishes appear not to have been discussed or assessed.
- Improvement in environmental education on aquatic resources in the universities and provinces.
- Promoting other sectors, such as industry, agriculture and forestry, to use limited amounts of chemicals and to adopt sustainable models for development, for example in agriculture integrated pest management and “VAC” (*vuong, ao, chuong* or garden, fish pond, animal house) system.

The Government has taken a number of decisions and measures to support aquaculture development as it increasingly recognises the contribution of aquaculture to poverty alleviation and rural development; but has tended to ignore inland capture fisheries.

In the annual review of the fishery sector in 1998, the Prime Minister emphasised the important role of aquaculture for sustaining fish production. He considered aquaculture as an underdeveloped sub-sector with significant potential for alleviation of poverty. This high level support resulted in Government approval of a development plan to ensure food security. More sustainable aquaculture production methods (e.g. introduction of better engineered ponds, increasing yields and reduction of pond area) are needed within that sector.

Although the coastal and inland fisheries sector involves many of the poorest and most vulnerable groups, and many donor-co-financed interventions within this sector have had an overall poverty alleviation development objective, MOF has played so far only a minor role in the HEPR strategy or other national efforts towards poverty reduction. The exception is Program 773 and some research and development projects supporting rural households. Since 1994 the Government has promoted Program 773, which aims to support rural people in using potential areas (flooding fields, swamps, tidal flats) for aquaculture. To date, the program has approved 100 countrywide projects allocating a total 1,130 billion VND for infrastructure construction and reclamation of “under used” areas. Linked with this, Research Institute for Aquaculture number 1 (RIA-1) especially has been involved in a number of research and development projects attempting to disseminate small scale aquaculture technology to farmers. The impacts on capture fisheries in these areas are unknown.

A large Government of Vietnam/World Bank/Danida reforestation and protection project entitled ‘Coastal Wetlands Protection and Development Project’ started in 2000. It involves almost 500 km of coastline and the project will focus on sustainable land-use and management of the coastal areas of Tra Vinh, Soc Trang, Bac Lieu and Ca Mau Provinces.

5. LIVELIHOODS ANALYSIS

5.1 Locations and stakeholder categories

Given the lack of studies focused on inland fisheries and the livelihoods of their users in Vietnam, the fieldwork undertaken for this study through Participatory Rural Appraisal (PRA) was vital. Four environments were identified and covered in the Mekong Delta. The PRA for main river location was conducted in Chau Doc and Can Tho district, the PRA for rice field and/or floodplain was in Chau Phu district, the PRA for swamps in Phung Hiep district of Can Tho province, and lastly the PRA for canals was done in Thoai Son district. During the PRA sessions four categories of people who depend on fish for their livelihoods were identified: full time fishers, part time fishers, landless subsistence fishers, and fish traders.

5.1.1 Fulltime fishers

Fulltime fishers livelihood entirely depends on natural fish capture, they catch fish year round, and sometimes beside their income from fish capture, some family members also get an additional income from wage labor (agricultural work).

This group of households reported that they are resident “professional fishers” and directly capture fish from river, canal and rice fields throughout the year and/or floodplains during the flooding season. A portion of their catch is for self consumption, while the bulk of the total catch is for sale, mainly to middlemen (fish traders) but sometimes direct to consumers, fish breeders and fish culturist. This group catches fish year round. However, during lean seasons when fish resources are rare, in addition to catching fish when they have free time, they go for daily wage labour (harvesting rice, loading rice etc) or any other jobs available from which they can earn money.

In this typical type of livelihood system, men are the main participants in fishing activities. However, sometimes women and children also help them, especially in the flood season (from September to November). When fishers bring their catch back home, women sort fish according to their size and value prior to selling. Fish trading, however, is the main task for women. Men and children only help women in sorting out the fish.

5.1.2 Part time fishers

Part time fishers rely for their main income on rice, but in addition they capture fish during the flood season for family consumption. If they capture more than family demand they will sell some fish. They also get income from raising poultry.

This group of people do not claim themselves to be professional fishers. While fishing for a certain part of the year, they normally have some land and often cultivate rice (Winter-Spring and Summer-Autumn crop); after finishing the Summer-Autumn crop, in the flood season, farmers go for fishing for home consumption, and the bulk are also sold to make profit. This group seems to be the most progressive of the stakeholder categories studied.

Gender relations in this particular livelihood category are similar to those of fulltime fishers, but women in this category of household do much more diverse work than in full time fishing households. They have to plant rice, weed rice fields, and help men in harvest and post-harvest activities.

5.1.3 Landless subsistence fishers

Landless subsistence fishers are very poor, most of their income is from wage labor (they can do any work for daily survival), and whenever they have free time they capture fish to sell and consume in the family.

This group of fishers have similar fish capture activities to the other two groups. However, this group does not have land for cultivating cash crops. Their livelihood primarily depends on daily wage labor, followed by fishing. The main fishing season of this group is during the flooding season, when agricultural activities decrease due to high water levels. Women in this category of households have to do any type of job they can get to maximize their family income. They catch fish, do homestead

gardening, and work for the big landlords as domestic help.

5.1.4 Fish traders

Fish traders live on selling fish, they buy fish from fishers to take to market to sell to consumers. This group performs a special kind of employment in the capture fisheries sector acting as middlemen to make a profit. Most participants in the fish trader PRA session were female, and they were not concerned for problems of social status or environment.

Table 9 explains the percentage distribution of households by main economic activity. Among all the households agriculture is the mainstay. However, those who do not have land or other means of living go fishing for an income.

Table 9: Percentages of households by economic categories

Main source of Income	Percentage of people
Agriculture	73
Small industry-handicraft	2
Business & services	12
Capture fishery	13

5.2 Seasonality and Hungry Period

The full-time fisher

The full-time fisher group often lack food when they cannot fish or work as agricultural labourers especially in January-February. They need capital during the months of May to August to buy fishing gears to prepare for the next fishing season. Besides, from February to March, they need money to buy tools to support agricultural activities or small business. Full time fishers have their largest catches of fish from September to November. During this period, their income is the highest in the year.

The part-time fisher

The busiest time for the part time fishers is during the two rice cropping seasons: first crop from December to March; and second crop from April to July. In the wet season, farmers often catch fish from August to November. This group remains free only during February. They need capital from November to February because in those months they do not get an income, neither from rice harvest nor from fishing. They use all their savings from the two rice crops to cope with the shortage. They also take credit to support Winter-Spring rice crop and school fees of their children, and at the same time they lack food.

Fish traders

For this group, December is the most difficult month, and their income is obviously lowest because in this month farmers begin to grow rice and fishers have no place for fishing, so traders get very little fish for sale. From May to July, they also face similar

difficulties when they have to subsidize their income from wage labour. The peak trading time is from October to November. During this period, income is highest. The rest of the months, they have to subsidize their income from agricultural labour.

Traders and part-time fishers are short of food for about 4 months annually, but not in the same period. Meanwhile fulltime fishers say they have three months of starving and for nine months they lack money. Part-time fishers seem to be most busy (only one free month), because most of the year they are busy growing rice. By the contrast, the fulltime fishers have the most leisure time (about 3 months).

Table 10 shows key seasonal events for the livelihoods of the four fisheries stakeholder categories.

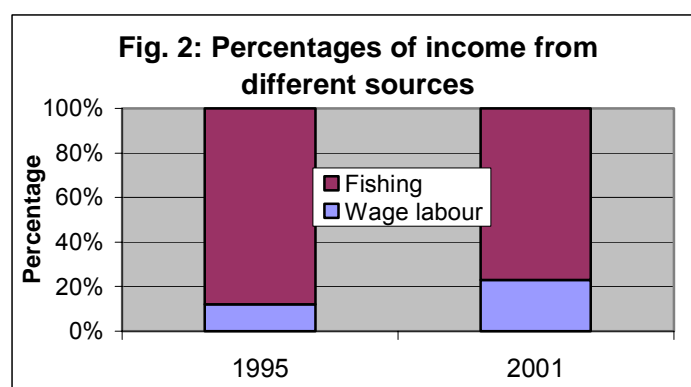
Table 10 : Seasonal events identified by stakeholders

Annual events	Traders	Part time	Fulltime	Subsistence
Capture fishery	-	Sep.-Oct. (2 months)	Jan-Jun (a little) Sep.-Nov (a lot)	
Leisure time	May-June (2 months)	June (1 months) or none	Dec-Feb. (3 months)	Dec.-Feb.
Grow rice (Winter-Spring, Autumn)/agricultural wage labour	-	Dec.-Mar. (crop 1) Apr. -Jul. (crop 2) (7 months)	-	Nov.-Mar Apr.- Aug
Fish trading	Jul.-Dec. (6 months)	-	-	-
Small size fish catch	Jun.-Jul. (small)	-	-	-
Low fish prices	September-November			
Flood	June-November (6 months) June-July (enter field) Sep.-Oct (highest)			
Hungry period	May-July; Dec. (4 months)	Sep.-Dec. (4 months)	Dec-Feb (3months)	Mar.-Apr.
Lack of money	May-July; Dec. (4 months)	Nov- Feb (4 months)	Dec-Aug (9 months)	Mar.-Apr.
Diseases	May-July (3 months)	June-July (young) Nov.-Jan (adults)	June-July(2 months)	

5.3 Income sources and levels

Fulltime fisher group

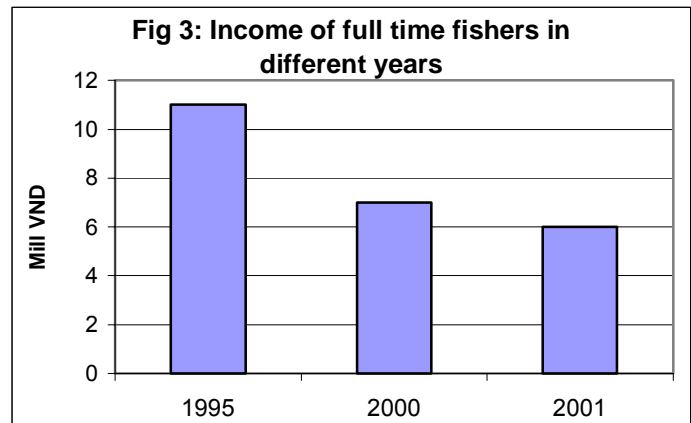
Full-time fishers are poor and mostly landless. On the basis of income sources, full time fishers can be divided into two groups: the first one relies entirely on fishing and the second one lives on capture fishery and agricultural labour (harvesting rice and carrying stones).



Income sources are the same over the year. However the percentages of income from fishing have declined compared to 1995 (Fig. 2).

Their income level also decreased over time (Fig. 3). They said that fish resources are becoming exhausted day by day due to dike construction for growing three rice crops a year and intensive

application of pesticide. Moreover, the number of fishers is also increasing day by day and they use modern gears (using electric devices for fishing). Besides having an income from fishing, they manage an extra income from working as agricultural labourers.



The part-time fisher

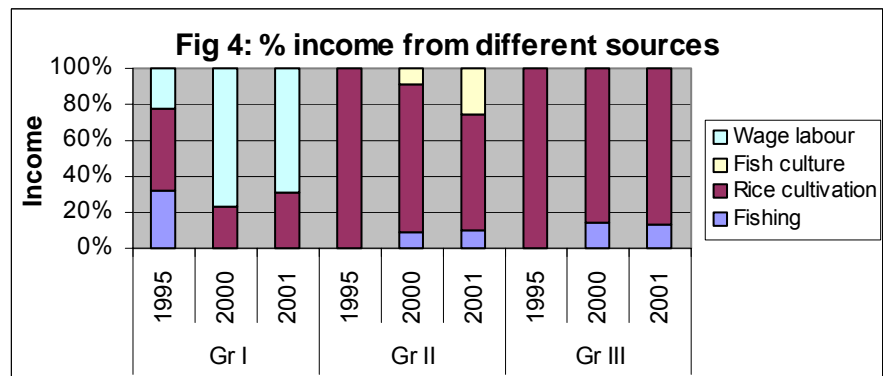
Part time fishers can be divided into three categories on the basis of their income sources (Fig. 4).

Category I: Part time fishers were earning from three different sources during 1995:

capture fishery, agricultural labour and farming, of which farming provided the highest income. However, in 2000 two main income sources remained: farming and agricultural labour. The shift is due to less availability of fish and shift to cultivating three crops a year.

Category II: starting from 1995, their income was based mostly on farming. In 2000, they have extra income from fish culture and they catch fish only to feed fish in pond or cages. Within this group, most families have pond culture.

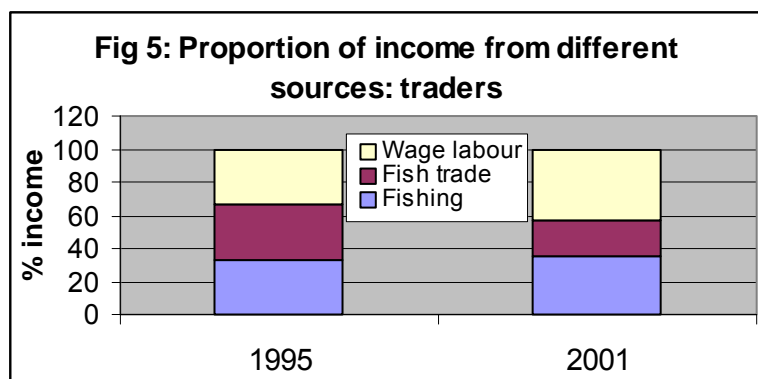
Category III: similar to group 2 and having extra income from the natural fish capture in 2000.



In general, the income level of part time fisher group tends to increase over the time. However, these income sources are not secured, but tends to change according to households condition.

Fish Traders

Most fish traders have three main income sources. Those are fish trading, fish capture and agricultural labour. The income difference



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s not large between 1995 and 2000 (Fig. 5). By 2001, income from fish trading had fallen (22% of total family income). In contrast, the income from agriculture labour increased to 43%. The reason given was that fish stocks are becoming exhausted and lands are used for three rice crops. This has reduced fishing grounds gradually. However, due to high demand for rice cultivation, they have more chance to work as agricultural labourers. In general, their income gradually reduced compared with 1995 to 89% in 2000 and 79% in 2001.

5.4 The Role of Gender

In this research, indoor family maintenance activities were not studied, but field activities such as fishing, fish trading and farming were analysed. Most family members aged thirteen and above are involved in all activities such as fish capture, trading and farming according to their ability. Men do the drudgery in the field such as capturing fish, farming and agricultural labour (digging, carrying stones, etc.) because they have good health to do such type of

heavy work. In contrast, simple jobs are preferred by women, children and elders such as grading fish, selling fishes, processing fish and pre-harvest (paddy cutting, weeding and straw spreading) and post-harvest farm activities.

6. TRENDS AND CHANGES

6.1 Environment and human use (from PRAs)

6.1.1 Fish

The fish traders do not often understand the trend in availability of fish. However, the fulltime and part time fishers have a common view that fish resources are declining remarkably (Table 11).

Popular fish species such as snakeheads, anabas, eel, loach, etc. have a declining trend - only about 30-60% remain now compared to 1975 and before (Table 11). The main cause of falling fish catches and populations is reported by the fishers to be the shift from single cropping of traditional rice to multiple cropping of high yielding varieties of rice. Other reasons given are that fishing grounds have been squeezed down regularly, and intensive use of agricultural pesticides such as Decis, Sherpa, Thiodan, etc in crop cultivation, which they say contributes to fish reduction. Besides, the farmers say an increasing quantity of fish every year are caught with new gears such as electricity.

Several species and aquatic animals that were important for food including freshwater prawn, snake, turtle, cá dầy, cá leo (*Walago attu*), thác lác (*Notopterus notopterus*) are becoming extinct due to the above reasons (Table 11). These species have a high economic value (export or consumed by restaurant customers at high price). This is one of the causes for high exploitation and the tendency is for a rapid decline.

Table 11 Trend in fish resources reported by full time fishers in PRAs.

Fish species/ scientific name	Before 1975	75-80	80-85	85-90	90-95	95-2000	Now	Future
Anabas (<i>Anabas testudineus</i>)	100%	90%	↓	↓↓	↓↓↓	↓↓↓↓	30%	Gradually decrease
Snakehead fish	100%	↓	↓↓	↓↓↓	↓↓↓↓	↓↓↓↓↓	30%	Gradually decrease
Hito (<i>Clarias macrocephalus</i>)	100%	↓	↓↓	↓↓↓	↓↓↓↓	↓↓↓↓↓	1%	Gradually decrease
Mè vinh (<i>Puntius gonionotus</i>)	100%	↓	↓↓	↓↓↓	↓↓↓↓	↓↓↓↓↓	50%	Gradually decrease
Linh (<i>Cirrhinus jullieni</i>),	100%	↓	↓↓	↓↓↓	↓↓↓↓	↓↓↓↓↓	60%	Gradually decrease
Loach (<i>Cobitis taenia</i> / sp)	100%	↓	↓↓	↓↓↓	↓↓↓↓	↓↓↓↓↓	30%	Gradually decrease
Freshwater prawn	100%	↓	↓↓	↓↓↓	↓↓↓↓	↓↓↓↓↓	Very rare	
Eel	100%	↓	↓↓	↓↓↓	↓↓↓↓	↓↓↓↓↓	30%	Gradually decrease
Small shrimp	100%	↓	↓↓	↓↓↓	↓↓↓↓	↓↓↓↓↓	50%	Gradually decrease
Thác lác (<i>Notopterus Notopterus</i>)	100%	↓	↓↓	50%	↓↓↓	↓↓↓↓	Rare	Extinct
Turtle, snake	100%	↓	↓↓	↓↓↓	↓↓↓↓	↓↓↓↓↓	Rare	Gradually decrease

6.1.2 Other aquatic resources

Wild vegetables are important food for fisher households. They say that they are not only delicious but also healthy (no residue of agricultural chemicals) and can be picked free of cost. Besides, wild vegetables can be picked just before cooking. However, wild vegetables are becoming rare and rarer (Table 12), reportedly because of over population, and over application of agricultural chemicals, which causes mass killing of wild vegetables in the rice fields. Only *Sesbania javanica* is still surviving on the edge of rivers, ponds, and ditches.

Table 12: Status of other aquatic resources

Wild vegetables	In traditional rice field	In high yielding rice field
Water-lily	Abundant	Rare
Water spinach	Abundant	Rare
<i>Jussiaea repens</i>	Abundant	Rare
<i>Sesbania javanica</i>	Abundant	Common
<i>Monochoria hastata</i>	Common	Rare

During 1990s poor and landless people when they have free time and need could also pick wild vegetables from the fields to get an income in addition to using them for food. Some households consider *Sesbania javanica* as an important income source in their livelihood in the flood season. They can sell the flowers at high rate and can earn 2,500,000 VND per flood season. Other wild vegetables were used to make fermented sour vegetable (Vietnamese traditional vegetable pickle) to sell in the provincial market. At present the wild vegetables they can gather are only enough for family consumption.

When farmers were still growing traditional rice (before 1983), wild vegetables such as water spinach, bông điên điển (*Ammania* spp.), lotus, water-lily etc were important for local people living in the flooded area as food, and the poor people could earn an income from them. After 1983, since high yielding varieties of rice have been introduced, wild vegetables disappeared gradually due to high application of herbicides. This decline is even more dramatic where triple rice crops were introduced.

6.2 Key macro exogenous challenges

Trade liberalization and the expansion of export markets have resulted in the rapid growth of exports and imports. The speed of change in the Vietnamese economy is evident in the dramatic rise in the external trade turnover on GDP from 58% in 1998 to 111% by 2000 (CPRGS, 2002). From 1991 to 2000, export of goods and services increased 3.6 times, while imports increased 3.2 times. Trade

liberalization policy has encouraged a significant rise in the number of domestic enterprises from all economic sectors involved in export and import activities. Demand for skilled labour has also been increased. Women specially are recruited in the garment industries and they established small scale family enterprises.

Vietnam is now a major rice exporter. The shift from one or two crops to three crops has changed the environment for fish. What were once seasonally open spaces are now used throughout the year and the owners prevent the poor from fishing or grazing livestock in their fields. This practice has reduced the income sources of the poor fishers. They have to depend on manual, unskilled, low paid wage labouring for the rest of the year when the fish population declines. Moreover, introduction of High Yielding Varieties of rice demands more fertilizer and pesticide use. These chemicals are polluting water and harming fish as well as wild vegetable on which poor people's livelihoods were dependent years back. With the advent of electric gears rich people can catch all sizes of fish. The poor cannot afford such gear and they hate to use these gears as they know these are harmful to the fish. Overall now-a-days in the true sense there are very few traditional full time professional fishers. Although people call themselves professional fishers they are not now fully dependent on fishing.

7. PROBLEM ANALYSIS

7.1 Problems

There are many urgent social and environmental problems in the society to be resolved in order to gain a better environment for the poor people to live happily. The acute problems for the poor at this moment are labour and employment. The level of income and productivity, especially in agriculture, is extremely low. The gap between the rural and urban is widening. A large proportion of workers have low skills and the percentage of untrained workers is still high. Science and technology did not develop and have not served as a foundation and dynamism for production and trade. Industries are developing at a slow rate in comparison to job market demand. Natural resources have been exploited heavily without any contingency plan. Fish, forest and other natural resources continue to decline.

Coastal areas are highly polluted and sanitation in rural conditions (including in rural, remote, isolated areas where ethnic minorities live) remain poor.

In general, all of the three stakeholder groups catching fish consider lack of capital as the most important problem for them. Besides, reduction of fish resources is a major problem for their livelihoods (Table 13).

Table 13 : Example of ranking of problems by three stakeholders at Thoai son.

Problem	Traders	Fishers	
		Part time	Fulltime
Ranking			
Unstable income from wage labor	5	-	-
Landlessness	1	-	-
Diseases	6	-	-
Many children	2	--	-
Unstable income from fish trading	3	-	-
Lack of capital	1	1	1
Increased number of fish traders: competition between fellow fish traders	4	-	-
Fish traders buy fish at lower price	-	-	3
Lack of fishing ground	-	2	2
Increased number of fishers	-	2	2
Use of banned harmful gears	-	3	4
Natural fish decreased	-	1	2
Low fish price	-	4	-
Low rice price	-	5	-

Particular problems of each stakeholder group are:

- For the fish-traders: competition among many local and outside traders.
- For the fulltime fisher group: low price of fish because traders always try to control price at low rate. There is an implicit conflict between fish traders and fulltime fishers group.
- For the part-time fisher group: beside the same difficulty as for the fulltime fisher group, this group faces low rice price as well as the risk of crop damage due to natural disaster.

7.2 Analysis of causes and effects

Table 14 shows an analysis of some problems considered to be important by all types of household summarized from the different PRAs.

Table 14: Cause and effect analysis for some common problems faced by fishery stakeholders.

Problems	Causes	Effects
Shortage of capital	<ul style="list-style-type: none"> • Sale during low price, unstable price • Many competitors • Many children • Can not lend money due to lack of security (land) 	Low income Poor fishers
Landlessness	<ul style="list-style-type: none"> • Loan with high interest • Money lenders seize lands • No inheritance of land 	No stable income for landless people
Fish declining	<ul style="list-style-type: none"> • Many people catch fish by harmful gears • Cultivation of high yielding variety of paddy with overuse of pesticides • Impacts to environment limits production • Not enough fishing ground 	Fulltime fishers, fish traders
Unstable paddy price	No tendency for increased rice export	Unstable income of part time fishers

7.3 Effects of external forces

Opportunities identified by primary stakeholders comprise:

- Support from government organizations such as association, local government and charitable group in the time of disaster such as flooding, disease outbreak etc.
- Big family labour force.
- The fish-traders can also get advanced loan from fish wholesalers or neighbors. The part time fishers can borrow money from bank because they have some lands (for 1000m² land landowners can get 1 million VND with 1% interest per month).
- The plant protection agency, agricultural service and department also provide training on agricultural technology.

Constraints identified by primary stakeholders comprise:

- Shortage of food.
- Lack of capital.
- Prices controlled by wholesalers (traders).
- Limited job opportunity.
- They often fall ill because of work overload and unhygienic living conditions.

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