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

VIETNAM COUNTRY STATUS REPORT

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1 Introduction

1.1 Country Background

The total area of Vietnam is 331,689 km^2. Almost all the country is surrounded by hills and mountains that divide into many sub-ecosystems, such as the mountains and midlands (middle elevation hills and plateau) of the north and centre, coastal central area, the western midlands, and southern delta and coastal wetlands. The river systems of Vietnam are diverse and interlaced. The length of coast line is 3,200 km and on average each 20 km has an estuary. However, there are two main estuarine areas: Red River and Mekong River (Fig 1). Another waterbody type is lakes, situated in many parts of Vietnam such as Tay Lake in the north, and the lakes in the midlands. They receive water from streams and from high water levels during high tide. Finally, ponds are the most important waterbody type suitable for household aquaculture, although water quality often changes too much because of household aquaculture.

1.2 Context

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 body areas are heavily exploited for fisheries. However, there are still high percentages of people (32% of the total population) living below national poverty level (World Bank, 2002). Life expectancy at birth is 69 years, and infant mortality is 37 per 1000 live births. The percentage of child malnutrition is 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, and only 25% of households own a television set.

Agriculture comprises 23.6% of the total national GDP (US$ 32.7 billions) in 2001, with an average annual growth of 2.8%. The resolutions of the Party Congresses VII, VIII, IX and the Decree of the Party Central Committee defined that in parallel with economic development and growth, Vietnam must concentrate on Hunger Eradication and Poverty Reduction. The resulting Hunger Eradication and Poverty Reduction (HEPR) strategy under the Ministry of Labour, Invalids and Social Affairs (MOLISA) has been recognized in Vietnam and internationally as a successful framework for poverty reduction. Over the last 10 years many policies, institutional changes, programmes and projects have been put into place to promote agriculture and rural development, build up irrigation systems, strengthen credit policies, support the marketing of products, all to increase the living standards especially of the poor. The intention for 2001-2010 is to expand the poverty alleviation content of HEPR, to eradicate hunger and enact policies that encourage communication of appropriate technologies, strengthen and diversify capital assets and reduce the vulnerability of the poor. Inter-ministerial co-operation is coordinated by MOLISA; with each line ministry responsible for formulation of policy and the mechanism by which this is implemented, and to provide implementation guidance at the local level.

Fig. 1 Map of Vietnam

Vietnam Country Status Report

The Ministry of Fisheries (MOF) played a limited role in the first decade of the HEPR strategy. Its focus was more on industrial and commercial scale development, especially of aquaculture. However, following lengthy discussion among Government officials of MOF and others concerned agencies and with effective support from Ministry of Planning and Investment (MOPI) and Norwegian Development Agency (NORAD) in March 2000, MOF hosted a Scooping Meeting on "Sustainable Aquaculture for Poverty Alleviation" (SAPA) in Hanoi from the 23rd – 25th May 2000. The meeting was attended by 100 representatives from MOF, MOPI, MOLISA, Ministry of Agriculture and Rural Development (MOARD), as well as provincial government agencies, people's organizations, International organizations and donors including NORAD, DFID, FAO and NACA who played a key role in planing and facilitating the meeting as well as AIT, DANIDA, ACIAR and UNDP, WB, ADB and many representatives from the Embassies.

The meeting identified several key issues including: the need to build a poverty oriented approach to policy involving better understanding of livelihood goals of poor people as a basis for identifying aquaculture interventions: the poor technical knowledge base amongst practitioners, weak capacity among institutions at all levels, poor infrastructure and the importance of cooperation among agencies involved in implementing and supporting poverty alleviation through aquaculture (MOF, 2001).

The HERP recognize that "aquaculture can be an entry point for improving livelihoods, planning natural resource use and contributing to environmental enhancement". However, inland fisheries are still a major livelihood dependence by the poor who live in rural areas countrywide.

Vietnam has made remarkable progress in economic growth and development since the beginning of economic reforms in the early 1980s. Since 1988, aggregate GDP has increased on an annual basis by an impressive 8-10% in real term putting Vietnam among the 10 fastest growing economies. Industrial sector growth has been rapid (13% per annum) whilst the well established agriculture sector has grown at an annual rate of4.7% as a result of the assignment of land use rights to farm households and the liberalisation of marketing arrangements. Vietnam is now the world's second largest exporter of rice after Thailand achieving an export volume of 3.8 million tons in 1998.

The performance of the agricultural sector has led to a dramatic improvement in the incomes of rural households, which have risen by 61% over the five years between 1993-1998 increasing the share of agriculture in the rural income to 47%. However, there is concern that the limit to increase rice production base on further expansion of the area under cultivation has been reached. Apart from the central highland, most land suitable for agriculture is already cultivated and new settlers have to do with less fertile land. These concerns taken together with the vulnerability of the world market for rice, reinforce the need for appropriate forms of agricultural diversification. A breakdown of the contribution of different categories of agricultural activities demonstrates that "there has been a tremendous diversification from rice". Though real revenues from rice cultivation have increased by 21% over this period, there have been increases of 53% in real revenues from livestock and aquaculture 55% from other food crop, 66% from industrial annual crops, and 27% from perennial crops.

Wild and cultured fish contributes about 40% of the total animal protein intake of the population. The per capita availability of fish has increased from 11.8kg in 1993 to 13.5kg in 1995 and is expected to reach a level of 15.0 kg by year 2000. During the last few years (1994-1997) the contribution of the fisheries sector to national GDP was about 3%. The sector has performed well attaining a rapid growth in production from 890,590 tons in 1990

to 1,969,100 tons in 2000 (MOF, 2000). However, the potential for capture fisheries is estimated to be limited, while the contribution of aquaculture to total production continues to increase, reaching 727,140 tons in the year 2000 (Fig. 2).

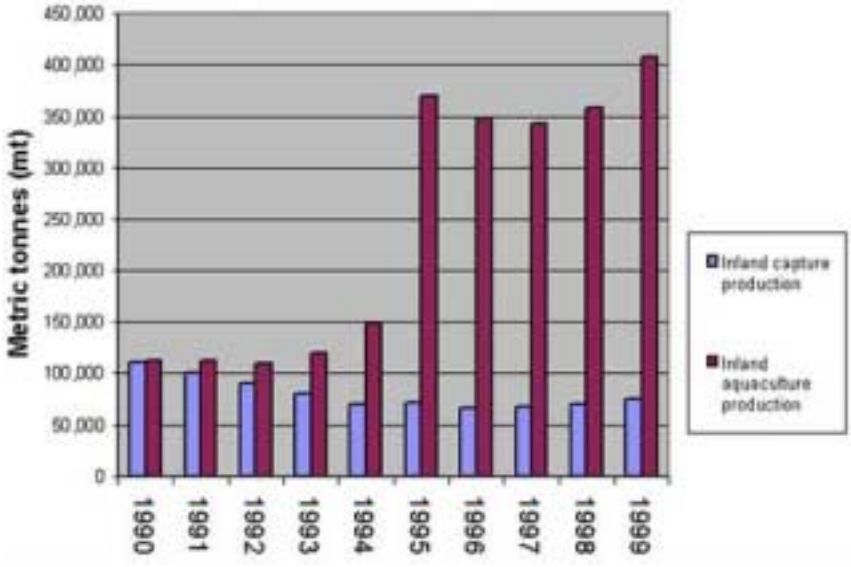


Figure 2. VietNam - Inland capture fisheries and aquaculture production (national totals). *Source: RIA 1, 2001*

Although aquaculture production has increased dramatically in Vietnam, there is some indication that more intensive aquaculture systems such as coastal shrimp farming have cause inequity (DFID, 2000). The Government has identified about 1.8 million ha of water surface suitable for aquaculture. However, in freshwater fisheries as well as in coastal areas aquatic resources are under threat from environmental degradation, over exploitation and poor management practices.

The major river fisheries are centred on the Red River and its delta in the north, which is now highly degraded, and more importantly the Mekong delta in the south. FAO studies from remote sensing flooding imagery show that up to 40 percent of the area of the Mekong delta in Vietnam is still flooded seasonally, mainly in the upper section. This is essentially an extension of the highly productive Tonle Sap floodplain system of the lower Mekong in Cambodia. Coastal regions are now largely under flood “protection”. A considerable amount of fish migrates into Vietnam from Cambodia (and quite possibly the reverse occurs also). The Mekong delta also has a large brackish water/estuarine fishery in its lower reaches. Vietnam also has very extensive rice cultivation and has recently challenged Thailand as the world’s top exporter. However, production is intensive with very high pesticide use and rice fish, rice-shrimp production has no doubt suffered as a result. Aquaculture is very well developed with 407,000 MT reported national production in 1999. Although there is no data available on inland fishery characteristics, as a whole, Vietnam has approximately 14 percent families working in the fishery sector (Dollar et al., 1998). They work on average 18.3 days per month and 5.9 months per year. Only 15.5 percent capture fish all year round, and 17.6 percent capture fish in a fixed location. However, in rural areas 93 percent of households are involved at some time in fishery. The annual hours of family labour are 1,800 hours, distributed among 2.09 workers employed per household.

Aquatic resources including wild fisheries, both inland and marine, provide a valuable source of income and nutrition for many poor people, and constitute an important component of diverse and dynamic livelihood strategies in a variety of agro-ecological settings throughout Vietnam. Small-scale artisanal fisheries are identified as being important particularly to poor and vulnerable households; and an even larger but significantly less visible number of poor people depend on inland capture fisheries as a component of wider livelihood strategies.

2. National Development Strategies, Reforms and Achievements

2.1 Introduction

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 strategy has been formulated by 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.

2.2 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 the 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 on the land reform policy, which allowed them to retain 15 hectares. Industrial crops and orchards were planted; about 1.1 million hectares of agricultural lands were transferred to the rural population, each peasant received 3 hectares. Vietnam 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, e.g. 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. 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 Vietnam Development Report 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.

The first challenge is to complete 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.

Keeping growth pro-poor, as in the 1990s, is the second challenge. 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.

This 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 the 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.

2.3 Policies, Institutions and Practices

2.3.1 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 and 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), output markets were privatised, input supplies decentralised and food grain subsidies removed) strengthened producer incentives and led to further productivity increases. Vietnam is now the largest rice producer and 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.

However, the increase in area has been 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 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.

2.3.2 Fisheries significance

According to the figures in Table 1, 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 1. Fisher households by region in 1990 and 1998.

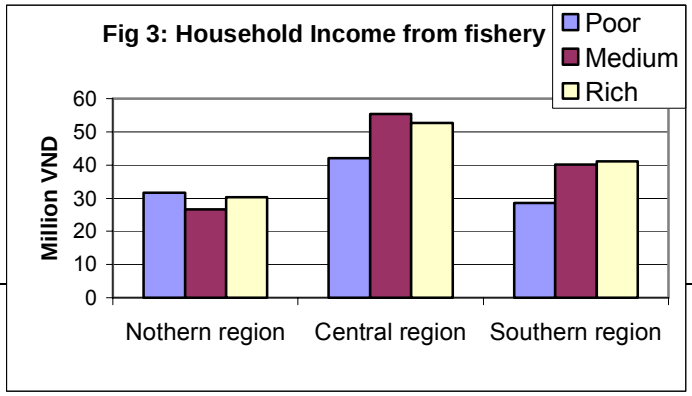
Region	Number of Fisher Households 1990	No of Fisher Households 1998	Number of Fishers 1990	Number of Fishers 1998
Red River Delta	12 415	16 745	55 326	77 630
North East	5 621	7 635	26 804	37 270
North West*	147	174	648	1 068
North Central Coast	62 610	72 967	309 843	370 798
South Central Coast	49 213	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)

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 (Fig 1). As has been mentioned earlier, income statistics for such small-scale fisheries are limited**.**

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 2.

Table 2. 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)

2.3.3 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.

MOLISA began co-ordinating the HEPR program 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 program for socio-economic development in the 1,715 remote and mountainous communes program. This program has an innovative concept transferring resources from the Government directly to the communes. During the first year of implementation in 1999, the project absorbed two-thirds of the budget allocated to the HEPR program and thus became flagship. Moreover the project was placed under the management of MOPI indicating the importance given to it by the Government.

Most recently a Comprehensive Poverty Reduction Strategy has been prepared which the Government was due to approve around mid 2001**.** 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 organisation and NGOs have been requested to prepare specific sector policies.

The Government has listed 7 project groups namely: (i) infrastructure improvement for the poor areas; (ii) processing technology and extension (agriculture, forestry, aquaculture); (iii) resettlement of the disadvantage groups; (iv) culture and information improvement; (v)

capacity building of all level; (vi) poverty alleviation or “monkey bridges” in the Mekong delta and (vii) building sustainable poverty alleviation models.

2.4 Fisheries and Wetland Problems and Trends, and related Policy Issues

2.4.1 Problems and trends

The current use of aquatic resources is not sustainable as the exploitation pressure increases partly by modernization of the fishing fleet (larger boats with better gear) and by the increase of the 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 natural shrimp recruitment is a common farming practice the 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 an extent where 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 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 all these 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 prevails. 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 waterwheel).

Throughout the Lower Mekong Delta there are problems with acid sulphate soils. Acid sulphate soil (ASS) 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 is needed of the natural fisheries. 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 conducted such as electric fishing in the inland fishery, 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 and forbidden.
- 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.
- It is necessary to develop and extend sustainable agriculture models such as VAC and rice-fish integrated farming system. This can increase fish production and hence incomes of farmers.
- Establishing fish sanctuaries to protect valuable genetic resources.

2.4.2 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. Among the policy issues, which are identified, are:

- The Environmental Law was pronounced on 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 on the rivers or lakes.
- Stocking fingerlings in rivers and lakes, for example grass carp and silver carp in the Red River.
- 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 inn 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 is 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.

2.4.3 Examples of projects and policy actions

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, 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.

2.5 Review of Inland Fisheries

2.5.1 Fishery in North Vietnam

Fisheries in this region comprise: the rivers, the delta and rice fields, and reservoirs.

In the rivers and streams, fish catches are about 50-200 ton/year depending on the size of the river (Table 3).

Table 3. Aquatic productivity on the rivers of Northern Vietnam

Name of river	Area (ha)	Production (ton)	Productivity (kg/ha/year)	Year
Cualo (Vinhphu)	125	9.2	75	1961
Vinhtrung (Namha)	49	2.45	50	1961
Dado (Haiphong)	250	11.0	44	1965
Cotieu (Haiphong)	203	10.2-13.5	50.2 - 66.5	1966-67
Dan (Haihung)	84	4.5-5.0	53.6 - 59.5	1967-69
Total	711	37.35-41.15	52.5-57.9	

Source: Thai Ba Ho, 1979, Nguyen Van Hao, 1995.

The Red River delta in northern Vietnam with an average population density of over 1,000 persons per km^2 is, in common with Bangladesh, one of the most densely populated rural areas of the world. Although the delta comprises only about 5% of Vietnam's total landmass,

its population is over 20% of country's total (Cuc and Vien, 1993). Thus, the delta has minute agricultural holdings of only 0.3-0.5 ha per household. Although 80% of the population of the Red River delta makes a living from agricultural activities, limitation of arable land is a major constraint to improve the livelihoods of its rapidly growing population. In these intensively cultivated rice-fields, the fish productivity is less than in rivers, but the area is much greater so that they supply in total a large catch (Table 4).

Table 4. The fish productivity in rice-fields of Northern Vietnam (Mai Dinh Yen, 1991)

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)

According to Nguyen Huu Nghi (1995), the fish productivity of the reservoirs was 24.5 kg/ha/yr as shown in Table 5.

Table 5. Fish production in the lakes of northern Vietnam.

Name of the reservoir	Area (1000 ha)	Ton	Kg/ha
Thac Ba (Yen Bai province)	19 - 23.5	463	24
Cam Son (Ha Bac province)	2.3	35	15

These are only estimates of fish production, which differ between local authorities. It is estimated that there are about 20,000 full time and part-time fishers, and that people fishing for an income catch about 50% of the production.

The reported fish production has fallen gradually, for example in the Red River 1,200 ton and 500 ton in 1985 and 1990 respectively; Chau Giang 200 ton in 1978 and 50 ton in 1982;and Chau Truc catch of 650 ton in 1966, 101 ton in 1976, and 70 ton in 1995.

2.5.2 Fishery in central Vietnam (Lac lake)

The fishery in Lac lake has just developed. In the time of French colonialists, the colonists used gill nets to catch fish and the indigenous H'Mong people caught fish with spears. From 1980, particularly in the 1990s, due to the migration of agricultural labourers, new fishing methods were introduced and the fish production reduced gradually due to over harvesting. As this is one of the few inland fisheries to have been studied in detail in Vietnam, a more detailed case study is presented.

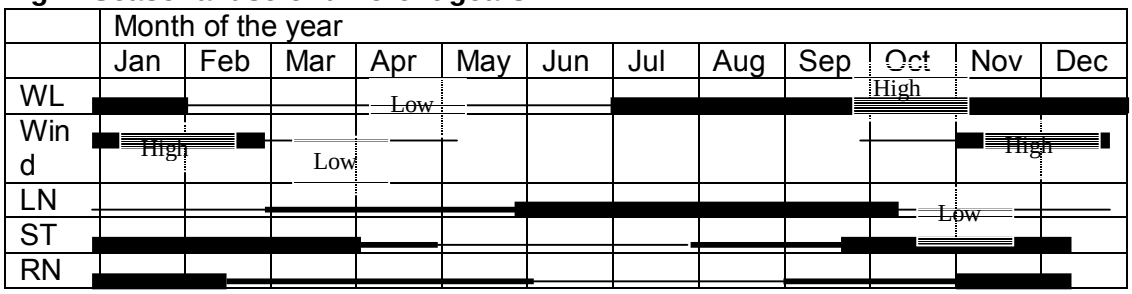
Changes in local fishing gear use

- Fork (spear): this equipment was used commonly by the H'Mong population for catching large fish, although the total catch using this equipment was low.
- Gill net: this is the oldest equipment used in the lake (from before 1945), it's use has increased and it is the most important fishing equipment here.
- Lift net: has been used from 1980.
- Traps: have only just been imported into the area some years ago.
- Shrimp trap: appeared here from 1985, it is the simplest equipment but has a high catch and could cause a problem in the lake ecology by breaking the food web.
- Round net: coming in from 1993, now it is an important fishing equipment in the lake.

The fishing season

Depending on the hydraulic conditions the fishers use different fishing gears to catch fish. Seasonal gear use is shown in Fig. 4.

Fig 4: Seasonal use of different gears



Legend: WL: water level; LN: lift net; ST: shrimp trap; RN: round net
Mostly used ▬ Less used ▬▬ Least used ——

Estimated fish production

Average fish production reaches about 3,900 kg/month (45 ton/year), which amounts to about 69 kg/ha.

Type of catch

Round net
In Lac Lake round nets have a mesh size of 20-120 mm so they catch relatively big fish. The highest production is *Osteochilus hasseltii* (24.6%), *Notopterus notopterus* (11.9%), *Ompok bimaculatus* (5.8%) and climbing perch (5.6%). Catches of small fishes such as *Toxapramis* and *Esomus* are not high using this equipment. Average total production is about 1,000 kg per month by using round net.

Lift net
In the Lac lake, liftnets are small mesh-size nets (4-6 mm) land are operated using lights. They only catch the photosensitive fishes such as *Toxapramis* (82% of catch) and some others (e.g. *Mystus* 4.8% and *Notopterus* 1.9%). Average total production is 640 kg per month.

Long line (hooks)
This gear was used at night, so the fish, which are active at nigh such as *Notopterus* (86% of catch) *Mystus* (6.7%), *Clarias* (2.9%) and *Mastacembelid* (1.1%) are caught. The total production is about 320 kg/month.

Trap
Being inactive fishing gear but covering a large surface area, traps catch a wide range of fish sizes. This is the most productive equipment; total production is 1200 kg per month. The highest production was *Exomus* (34%), *Toxabramis* (24,9%), *Osyteochilus* (17,6%), and *Notopterus* (4.3%).

2.5.3 Mekong Delta

The Mekong Delta covers 369 million ha, which is about 12% of the whole country. Total agricultural land is 2.46 million ha including 1.97 million ha used for rice cultivation. The total water surface is about 954,350 ha (excluding rivers). Some of the better high lands have been developed for aquaculture. Farm households in this area depend on farming for income. Average household income is about 6 million VN dong per year (1992), of which 60% was from cultivation and planting activities, 10% from animal raising (including aquaculture), 5% from service and 4% from processing. Dependence on agricultural

production makes agriculture development of primary importance in the region to help the people out of poverty.

There are 145 taxa of fish and 14 taxa of shrimp distributed in the freshwater areas of the Mekong delta, They include 13 taxa of high value fish and 3 taxa of high value shrimp (Xuan et al. 1995). Those were the most important natural resource for fishery and aquaculture that could improve the farmers' life. Annually, 50,000 tons of fish are produced and billions of fry and post-larva are harvest. In Can Tho province alone there are two billion shrimp and fish seed produced/caught every year (Fishery magazine, 1990; NEDECO, 1993; Xuan et al., 1995).

Fish production in this region has fallen by 10-15% in comparison to 20 years ago (Sinh, 1995; Sinh et al. 1997a and 2000). The many reasons identified were: poor knowledge in fishery technology, use of harmful gears such as electrical shock and chemicals, use of nets with small size mesh to catch fish in the breeding season, and reduction in recruitment of these aquatic resources due to dams and embankments.

2.5.4 Status of aquaculture

In Vietnam the potential area for planned aquaculture development is estimated at 1.82 million hectares including one million hectares of freshwater, 375,500 hectares of brackish water and 445,000 hectares of marine water. Inland planned aquaculture developed earlier than coastal aquaculture, but the latter has been catching up because the export market favoured marine products such as shrimp and crab. Inland planned aquaculture has existed for a long time in Vietnam. Until now, most farming systems were extensive, using on-farm waste inputs and domestic wastes to produce fish. Fish can be cultured in small ponds, cages, rice fields or even in reservoirs. Inland aquaculture is more developed in the northern and southern regions and less developed in the central region especially in central highland and south central coast. The reason is that northern and southern farms can take advantage of Red and Mekong River systems. In contrast, in central regions, there is a limited supply of freshwater for inland aquaculture, especially during the dry season.

The potential capacity of domestic aquaculture production is 3.5 million tons per year, of which 30-40% is used for export. Fish output increased from 1.58 million tons in 1995 to 1.88 tons in 1999, an increase of 8.4%. Output of shrimp and freshwater fish increased from 265,000 tons in 1995 to 364,700 tons in 1999 (April 2001 GC.com)

3. Poverty

A survey in 1993 showed that the population under the "overall poverty line" (annual per capita expenditure of VND 1,160,000), was as high as 58%, while as many as 25% were below the "food poverty line" of VND 750,000. Another key social indicator child malnutrition - the incidence of stunting of children under the age of 5 - showed that 51% of children were malnourished. Enrolment at lower secondary school level had fallen to 29% of eligible female children and 30% of male children by 1993 following economic restructuring during the last 1980s. By 1998, the situation had improved dramatically. A significant but much decreased 37% of population were then classified as poor in relation to the adjusted overall poverty line (US$ 92). The incidence of child malnutrition had fallen to 34% and lower secondary school enrolment had rebounded to around 61%. 29% of rural households now had clean drinking water and 77% electricity, and in material terms 58% of households owned a television set.

About 80% of the total population and 90% of the poor people live in the rural areas in Vietnam. Among the regions, poverty incidence is higher and deeper in the northern Mountain and Central highlands, where 59% and 52% remained in poverty in 1998, and where the poverty gap index was 16.8 and 19.1 respectively. In coastal areas, 48% of the population along the north central coast remain below the poverty line, but the depth of poverty was rather lower with an index 11.8. However, the differences on several indicators (with the exceptions of fish consumption and income) between these poor upland regions and the main inland fishery region (the Mekong Delta) are not great (Table 6).

Table 6: Indicative figures reflecting poverty situation of typical geographical regions

Indicative figure	Northern mountain	North central	Mekong delta
Per capita rice consumption (kg/month)	14.38	13.41	13.37
Per capita fish consumption (kg/month)	0.4	1.11	2.44
Per capita meat consumption (kg/month)	0.97	0.71	0.98
Income (VND/month)	173,760	174,050	242,310
Living expenditures (VND/month)	149,800	137,920	194,290
Malnutrition rate (%)	41.25	41.58	42.19

Source: SAPA, 2001

The cause of poverty is diverse depending on geographical locations. For example, the northern mountain population is suffering poverty as a result of geographical isolation, limitations in land area for rice cultivation, poor communications and transport infrastructure, poor public and extension services (including health and education), and difficult access to markets and credit services. The supporting policies and assistance from the Government also have difficulties to reach to grassroots levels in these areas. The people in the northern central coastal areas have very little arable land and aquatic resources that are an important part of people's livelihoods in these areas are over exploited. Moreover, a harsh climate with high risk of natural calamities such as typhoons and flooding makes the livelihoods of people in this area particularly vulnerable.

4 Inland Fisheries in the Context of Livelihoods

4.1 Livelihood Options and Income

Full time fishers are often amongst the poorest households, and fishing is a supplementary or seasonal activity for many poor and vulnerable people. Aquatic resources, including non-fish resources, often provide poor people with an important source of nutrients, which are not easily substituted, and an important economic activity, if only seasonally. There is evidence that poor people in mountain areas are able to maintain kinship connections by using small scale aquaculture ponds as the means of receiving guest for funerals and weddings that otherwise would represent significant shocks to their livelihoods. There is also evidence that landless and land-poor people depend heavily on swamp and mangrove fisheries often capturing small non-fish aquatic resources. There is evidence that community management of water bodies and dry season refuges or other forms of rehabilitation of fishery habitats and enhancement can improve poor people's livelihoods. The capacity of poor people to engage in aquaculture depends upon their asset base including human asset, natural assets, social assets and financial assets. The outcomes that people chose and their capacity to convert their assets into those outcomes is influenced by the wider social area in which people live and the policies, institutions and processes which affect their lives. Therefore, interventions which aim to support poor people to manage their aquatic resources need to be identified based on an understanding of poor people's livelihoods (DFID, 2000).

Household freshwater fish catches are mostly used fresh, but processing and trading are also livelihood options. Some species with high biomass such as snakeskin gouramy and snakehead could be processed into dried fish or fermented fish (as with shrimp and *Thynnichthys*). High value species such as giant freshwater prawn, *Pangasius* catfish and sand gobi are exported. The income of the traders from fish sale depends on the structure of the market as shown in Table 7.

Table 7. The income margin of fish traders in different scales of market.

Location	Trader's margin (% of sale value)
Local market	+10.0
Village market	+10.3
District market	+29.77
Provincial market	+38.27

Source: Sinh et al. (2000)

In the local or village market, the middleman receives a low mark-up, they then transfer fish to larger (urban) markets where consumers always pay more money than rural people.

4.2 Livelihoods in South Central Estuarine area

4.2.1 Vulnerabilities

Commonly 80% of households in coastal communities get their income from fishing, whilst almost all livelihoods rely on fish capture and associated activities as coastal communes have little agricultural land. Poor coastal fisher livelihoods are vulnerable to seasonal weather, destructive typhoons and migration. For 3-4 months annually fishers rely on savings or credit to buy food. Recently natural capital has declined (due to over fishing, introduction of other gears fishing the same stock, destruction of mangroves for construction of large shrimp ponds). Negative impacts of high-risk (shrimp) aquaculture have contributed

to landlessness of some poor people e.g. in Travinh, due to indebtedness caused by failed harvests due to shrimp disease. Such risks can be recognised and reduced through adoption of low risk aquaculture techniques and by providing appropriate extension and resource management which support the needs of poor people. Social capital in the form of fishing co-operatives promotes collective action, provides safety nets, though their resources are linked to the productivity of the fish resources. People's organisations provide connections, information and access to extension, assets and asset building opportunities.

The capture fishery has declined due to over fishing and habitat loss, the use of pesticide in early rainy season and low pH in canal from acid sulphate soils. Many poor people who depend on aquatic resources have lost their livelihoods and now changed their livelihoods pattern. However, improvements in management and farming systems of mixed shrimp-mangrove farm in Mekong delta have led to improvements in livelihoods, providing an alternative for poor people to cutting of mangrove forests.

Frequent flooding in the delta makes it necessary for farmers to elevate land for housing and crops, giving rise to physical assets such as ponds, canals and rice fields. In the mountain regions where wild fish stock have declined but water is stored in reservoirs, poor people stock fish are reducing their vulnerability to crises and improving their food or financial security.

Seasonality: The main fishing season is from January to April lunar calendar (February to May), followed by a secondary season, also called off-season, but when fishing continues, from June to October. In late October or November the bad weather starts with typhoons. From the end of October to February fishing is conducted if there is good weather, there are however few fish, and most of the time is spend repairing boat and gear etc. In the 3-4 months of the year when the weather is bad, with limited possibilities to go fishing many fishers depend on credit from middlemen for money to buy their daily food.

Shocks: Typhoon are common and destructive and can represent significant shocks to coastal people's livelihoods (for example, houses in Xuong Huan Commune were destroyed in a typhoon in 1992, and they have lived in temporary shelters, simple bamboo mat stilt houses since then). A forced resettlement was planned but they seem to have received very little detailed information and have few ideas about where they will be going. The problem is that they have no entitlement to land, and that where they move they are supposed to pay for land, which they cannot afford.

Trends: The south central coast has been influenced by several migrations in the 1960s and early 1970s. During "the American war", fishers from the provinces north of Khanh Hoa (especially from Phu Yen, but also Binh Dinh and Quang Ngai Provinces) came to Xuong Huan, because of the heavy fighting in these provinces. Richer migrants brought boats or money and favourable conditions gave rise to an increase in the number of vessels during the 1980s and 1990s, recently this has been stagnating and numbers decreased in the last two years. There is a small tendency for people who cannot repay their loans to sell their boats, and leave fishing (or to continue as crew). Recently, the catches from standing nets have been declining (this might be due to the introduction of other gears harvesting the same fish stock, before they reach the standing nets).

4.2.2 Capital Assets

Physical**:** Their housing is poor, with sand floors and bamboo mats for walls. There are three main fishing gears: (i) standing net; (ii) purse seine for anchovies; and (iii) hand line and long line for tuna and mackerel. Most (poor) coastal dwellers do not have their own boat, but work as crewmembers. The price of the boats and gear is high, 30-40 million VND for one long

line with 500 hooks. Standing nets are 5-700 meters long, and each co-operative member may "own" a number of fragments.

Social: Fishing co-operatives, which work together and share physical assets and negotiate access to natural capital such as standing net sites, are organised at the commune level, but can be too big and bureaucratic and some are reorganised on a village basis. The standing net co-operatives provide members with a very low income, which provides security against hunger) in the off-season period (November to January). The income for the members depends on the catches, and on their position in the co-operative (they are given work points according to their position). Most of the fishers migrating to Nha Trang had been there before and had contacts in the town through earlier fish landing and trading. To keep a more stable crew many boat owners employ relatives from the province of origin. There is widespread membership of a number of people's organisations. The Women's union has organised groups in each hamlet, where the women meet once a month. Many people left after reunification in 1975, (e.g. 804 persons left as boat people from Vinh Tho Commune prior to 1988 and settled in the same community in California), many of them have been back to visit, they provide family remittance, and have established a community fund, where they transfer funds to the Peoples Committee to enable them to buy 10 tons of rice per year to provide for the poor households in the commune.

Human: A qualified and experienced fishing crewmember is in high demand. The crew vote with their feet, i.e. they select the vessel (and captain) where they expect to gain the highest income.

Financial: Many immigrants brought boats and money with them, and many of the wealthiest households currently are from earlier migrating households, (which might mean that it was the wealthiest households that could afford to migrate and did so). Due to declining resources and catches the income of many is now very low, close to a survival salary, and there is no room for savings in the households. Around 30-40% of many communes have insufficient money to buy food during the season when there is no fishing.

Natural: The sites/plots for mounting the standing nets in the sea are limited. In some locations the mangrove forest has almost totally disappeared, the land has been cleared, and large shrimp farming ponds have been constructed along the coastline and in lagoons. It is very difficult for fishers to get access to land; therefore few fishers participate in aquaculture. The development of cage culture in marine waters is very poorly developed, but there are no restrictions on where the fishers can set up their cages. Wild fisheries stocks are declining.

4.3 Livelihoods in Mekong Delta Area

4.3.1 Vulnerabilities

Seasonality: During the Mekong flooding seasons (August/September-October/November) land (e.g. in Long An (the Plain of Reed area), Tien Giang, Dong Thap, and An Giang provinces) regularly floods 0.3-3m and farmers in these vulnerable areas cannot grow rice. During this period fishing is an important source of livelihood. In the dry season the river flow can reduce by 95% and saline intrusion occurs (more serious during recent years).

Shocks: Flooding in the delta can submerge even towns and roads, break dykes and destroy bridges, causing serious damage to agriculture. Serious floods tended to occur in 4 year cycles but recently have been an annual occurrence symptom. For example, 2000 saw the worst floods since 1961 with all districts affected.

Trends: The key trends are rice intensification (from 180-210 day rice monocrop of about 1 $t.ha^{-1}$ to two short duration crops in 100 days of about 8-10 $t.ha^{-1}$), mangrove destruction (70%), Melaleuca forest destruction (95%), increased population pressure (2.2% growth pa), small land holdings and increased exploitation of wild fish. The wild fishery on which the livelihoods of many of the delta's poor depend is declining. In the Plain of Reeds the fishery is declining due to over fishing and habitat loss. Previously the flooded Melaleuca forest was a good environment for fish, this is now removed for rice paddies (50% lost in Long An). Other factors are pesticide use for high yielding variety rice, and low pH in canals during the early rainy season. Along the coast (Long An Tien Giang, Ben Tre, Tra Vinh, Soc Trang, Kiengiang, Bac Lieu and Ca Mau) saline intrusion (in part due to shrimp culture) has reduced rice yields and reduced wild catch of freshwater fish. In other parts of Ca Mau salinity protection has allowed the expansion of the area of land under double-cropped rice. As the surface water in the protected area has become increasingly fresh, the area under shrimp (*P. monodon*) has reduced. Salinity protection interventions are increasing acidification of acid sulphate soils in the dry season, and consequent canal pollution. The less saline, more acidic canal waters affect aquatic resource production and biodiversity. This in turn appears to have adversely affected landless labourers and small farm holders who have relied on capture of aquatic resources to supplement their income and food intake.

4.3.2 Capital Assets

Physical: The poor tend to have less/no land and are most dependent on aquatic resources and have been impacted by agricultural intensification. Frequent flooding makes it essential for farmers to elevate land for housing and crops giving rise to ponds and canals and rice fields and aquaculture is practised is these by 60-70% of household. In irrigated areas e.g. Tay Ninh Province (Trang Bang and Chau Thanh districts) there is some access to sub-canal (irrigation level 2 canal) water available year round for aquaculture (common systems include tilapia, pangasius, common carp and kissing gourami). In rainfed areas many fish ponds are created when raising ground to construct houses (e.g. Duc Hoa district (lowland rainfed) of Long An Province, Dong Phu (rainfed midland) district of Binh Phuoc province). Such rain fed fish ponds commonly grow catfish, tilapia and kissing gourami as it is difficult to manage water quality.

Social: There is widespread membership of a number of people's organisations. The women's union has organised groups in each hamlet, where the women meet once a month. The fartherland foundation is also well represented. There are close links between Khmer ethnic groups in Cambodia and delta dwellers.

Human: In general educational level in the delta is low. Near the Cambodian border (An Giang, Tra Vinh, Soc Trang, Kien Giang, Bac Lieu) a lot of Khmer groups have low education, lack of technical knowledge and live in poor conditions. Migrants (official and unofficial) lack knowledge of how to manage problem soils (severely acidic and old alluvial soils).

Financial: In Long An, 60% of households are on low incomes (22 million VND per household - 5.7 persons on average), or 321,637 VND per person per month.

Natural: The key natural capitals in the delta are land, water and aquatic resources. The key issues are their quality and quantity. 28% of land is alluvial soils suitable for rice, 40% is acid sulphate (some are heavily acidic with dry season water pH value of as low as 1.5), 21% is saline, the rest is upland. Land has been distributed evenly. The average land holding is 1-1.1 ha up to 2.4 ha in Long An. In Vinh Long and Ben Tre provinces; landlessness is increasing as a result of high provincial population and small land area so after equitable

distribution each family has only a few square meters to farm. As the returns are too small so people sell or lose land, increasing landless. In the Ca Mau peninsula agriculture centres on a single, extensive, wet season crop of rice. At Soc Trang and Bac Lieu, there is a lot of natural grass cover. Eighty-three percent of low-income families fish in rice fields, canals and rivers, catching on average 531 kg of fish per household per year, of which half is sold providing 14% of income, they eat on average 60kg of fish per person per year.

4.4 Livelihood Characteristics of Fishers in Other Aquatic Environments

4.4.1 Poor living around lakes, reservoirs and rivers

Poor people living in or near wetland areas fish for income because they have no access to land and other productive resources. Moving into fishing is often a last resort for the landless and displaced people. They tend to lack infrastructure, sources of credit, and extension services. Unable to diversify production and therefore highly dependent on aquatic resource based livelihoods they have highly vulnerable livelihoods. Many people resettled to reservoir areas after flooding of their land. They received little compensation from government, and often have no history of fishing. They include both full-time fishers and occasional /opportunistic fishers. Not all people who fish from reservoirs are poor. Many who have access to land, efficient gears and other productive resources are not poor.

Aquatic resource issues: Aquatic resources are seriously degraded due to environmental degradation, over-fishing, and ineffective state management resulting in low production levels. In some areas there is experience of small-scale aquaculture projects, and in small-scale capture fishing. There is no policy on resource management in these areas – particularly on fisheries. There is little local experience of aquatic resource management.

Locations: All regions – but in particular Northern Uplands and Central Highlands. Specific sites include Thac Ba reservoir (Yen Bai province), Nui Coc reservoir (Thai Nguyen province), Tri An (Dong Nai province, South East), Dau Tieng (Tay Ninh), Hang Then (Cao Bang province).

4.4.2 Poor living in inundated areas, areas prone to flooding and in flooded forest areas

People in these areas are often landless or land short, and lack capital and access to productive resources. These environments are vulnerable to storms and extreme floods. There are capture fisheries during flood/inundated periods and aquaculture in ponds.

Locations: South East and Mekong Delta, Melaleuca forest areas of Mekong Delta: Long An, Dong Thap and An Giang Provinces.

4.4.3 People living in coastal areas

Some of the poorest people are full-time fishers and those most dependant on fishing as they do not have access to other productive resources. Marine resources near the coast are more seriously depleted but they lack the capital, boats, etc. to be able to go further to sea. The poor lack capital to invest in shrimp aquaculture. They are vulnerable to floods, storms, etc. Although not isolated in terms of communication, alternative employment opportunities very limited. There is a high percentage of landlessness due to finite land resources.

Aquatic resource issues: Near coastal fisheries have declined. The poor are unable to invest in gear to fish further out at sea. Few coastal communes have been included in the 1726 Poor commune programme. There are few alternative livelihood options.

Locations: North and Central Coastal areas are most prone to natural disasters. Nha Phu Lagoon, Khanh Hoa Province faces extreme aquatic resource depletion. Ca Mau (Mekong Delta), Tam Giang Lagoon (Hue), and O Loan Lagoon (Phu Yen), Thi Nai (Binh Dinh), Lang Co Lagoon (Hue) also face resource depletion.

4.4.4 Landless and land-poor living on infertile soils

Midland and some coastal areas have poor soils as a result of deforestation, with high erosion, and poor access to fresh water. There are few opportunities for alternative livelihoods, and limited extension services. There is growing inequality within regions and a growing issue of landlessness, particularly in the Mekong Delta.

Wild (capture) fisheries have declined. This is partly attributable to the use of fertilisers and pesticides for rice cultivation due to government efforts to increase rice production. But there has also been a loss of dry season wild fish refuges in areas prone to saline intrusion.

Locations: To some degree all areas have suffered depletion of wild fishery resources as a result of intensification of agriculture production and environmental degradation. Examples include: acid sulphate areas of the Mekong Delta (viz Dong Thap Muoi region, and Long Xuyen quadrangle), upland areas in North and Central regions. Mangrove and Melaleuca forests in Kien Giang, Long An, An Giang, Dong Thap and Ca Mau provinces. Landlessness is particularly significant in the Mekong Delta

4.4.5 Ethnic minorities

The key issues for ethnic minorities are limited land, isolated areas, and that they are prohibited from cultivating in sloping areas. The Khmer often live in saline and acid sulphate soils, with poor agricultural opportunities. Poor access to extension services, often isolated with limited infrastructure (including access to markets). Culturally isolated.

Aquatic resource issues: Some ethnic groups in mountainous areas have a tradition of aquaculture, and have good experience from aquaculture extension. The Khmer are traditionally involved in small-scale wild capture fisheries, but are now facing resource depletion. The Pako are involved in cage and pond aquaculture, and capture fisheries in rivers and springs.

Location: Northern Uplands, Central Highlands, Mekong Delta bordering Cambodia. H'Mong people in upland areas, Khmer people in Mekong Delta areas, Pako, Van Kieu and Ta-Oi in midland areas.

4.5 Conclusions on Poverty and Fishing

In terms of poverty the wild fishery, both inland and coastal, is of greater importance than aquaculture (cf. Wysocki and Friend 1998). While poor people have generally not benefited from aquaculture extension, they have tended to become more reliant on wild aquatic resources as a result of indebtedness, landlessness and displacement. Several types of initiatives are possible, including rehabilitation of fishery habitats and enhancement, as well as a variety of forms of co-management regimes. These may also be combined with aquaculture activities.

Preliminary evidence from the main research initiative concerning wild fisheries in the region (the Assessment of Mekong Fisheries Project of the Mekong River Commission) suggests

that inland capture fisheries remain of considerable importance in rural livelihoods in the Mekong Delta. As with other similar assessments, however, the significance of aquatic resources according to wealth categories is not available.

Limited education and knowledge, which includes limited Vietnamese language skills and literacy skills, limited exposure to new functional and technical skills, lack of access to the mass media and low levels of interaction with outsiders all constrain improving the lives of many people dependent on capture fisheries. Education and linguistic constraints are seen to limit the degree to which ethnic minority people are represented in local authorities and reduce their confidence to access public services.

The greatest threat to fish biodiversity arises from other sectors, where activities can promote extensive loss of habitat, ecosystem simplification and reduced water quality and quantity. The current socio-economic benefits arising from the river fishery provide the major economic and social argument for improving integrated natural resources management to address the problem of general ecosystem decay. Recently, this consideration is demonstrably influencing development policies. Overly negative attitudes toward the impacts of fisheries on biodiversity in rivers will undermine biodiversity conservation, especially in the Mekong.

Whilst the potential for capture fisheries is estimated to be limited (up to 1.5 million tonnes per year), the contribution of aquaculture to total production continues to increase, reaching 727,140 tonnes in year 2000. According to statistics, more than 3.4 million people are engaged in the fisheries sector. Among these, about 600,000 are involved in the aquaculture sub-sector. The government has identified about 1.8 million ha of water surface suitable for aquaculture. However, in fresh water fisheries as well as in coastal areas aquatic resources are under threat from environmental degradation, over exploitation and poor management practices.

5 Problems and constraints

Whilst having considerable potential, there are several key challenges that need to be addressed for reducing poverty in general:

- The problem of internal migrants who move without papers to inner cities and are missed by the official poverty alleviation measures;
- The need to shift access to credit away from relatively privileged sectors of the economy such as state enterprise to the majority of poor people living in rural areas, in order to stimulate off-farm production;
- The difficulty of involving the poorest sectors of society in decision making and making local government structures more accountable and responsive, the poor people do not receive information about government decisions and program and are not consulted about decisions that effect them and in particularly there is a need to address gender in equalities which dis-empower women within household and the community;
- The need to improve inadequate targeting of poverty alleviation program and link such measures more closely to the restructuring of the economy by addressing problems of vulnerability;
- How to help the upland regions with their ethnic minority population, catch up and ensure that poverty reduction is spread more evenly; and
- That while there has been a steady reduction in poverty a very large number of people are poor or very poor people cite, at both community and household level, to shocks such as cyclones, disease, animal disease, droughts, …and need for prevention measures and insurance.

6 Conclusions and Recommendations

In concluding it is necessary to consider how to account for the lack of data on poor people and aquatic resources. This has been an issue that DFID has been addressing in the region (see Wysocki and Friend 1998). While there is growing evidence of the importance of aquatic resources for poor people it has not been systematically brought together. Production orientation of DOF has lead to collection of a certain kind of data, and also to targeting those most able to produce. This has been reflected in aquaculture promotion strategies. Although there have been efforts to promote aquaculture in poor areas such as the Northern Uplands, there is less evidence that poor households have been targeted in these poor areas. At the same time, there is limited evidence of poverty alleviation strategies realising the full significance of aquatic resources in poor people's livelihoods and their potential.

The review on which this report is based has raised a number of issues summarised below:

- Despite an overwhelming volume of statistical data on poverty, using a range of economic indicators there is almost no data available on the role of aquatic resources in poor people's livelihoods. This is largely attributable to the inherent difficulties of measuring such livelihoods' significance within traditional assessment approaches.
- Despite a large volume of socio-economic data on aquaculture, the vast majority deals with production systems, input-output analyses, and cost-benefit analyses. There is no data available within the aquatic resource sector on the role of aquaculture in poor people's livelihoods that adopts a livelihoods framework.
- At provincial and lower levels, every province has its own data collection system, but the data obtained are insufficient and inadequate and focuses on the marine sector. The system of monitoring, control and surveillance for fisheries has been adopted in Vietnam but this too has not attained the desired level of performance.
- Official data either fails to break down the range of aquatic resources among the whole resources systems, and/or fails to disaggregate into wealth categories.
- Participatory poverty assessments overlook the full significance of aquatic resources in poor people's livelihoods. Even when passing reference is made to aquatic resources, there is no discussion within the reports.
- Poverty issues have not been addressed within the fisheries sector. Where there have been attempts to promote aquaculture under a poverty-alleviation initiative evidence suggests that the poor have rarely benefited, or even been targeted, although poor regions have been targeted.
- Data on capture fisheries does not discuss the wealth categories of professional fishers. Data on professional fisheries overlooks what can be anticipated to be a far larger number of people who combine fishing with other livelihood strategies, and who are not classified and do not classify themselves as 'fishers'.
- Preliminary evidence from the main research initiative concerning wild fisheries in the region (the Assessment of Mekong Fisheries Project of the Mekong River Commission) suggests that inland capture fisheries remain of considerable importance in rural livelihoods in the Mekong Delta. As with other similar assessments however, the significance of aquatic resources according to wealth categories is not available.
- There is some data available concerning poor coastal fishing communities. This tends to be available from research projects rather than official sources.
- Much of the official data on aquatic resource consumption is rather limited. There is some contradiction between VLSS and FAO nutritional data. VLSS clearly indicates that

aquatic resources are of great nutritional significance in Vietnam, and more so for poor people.

- There is growing evidence to indicate that dependence on aquatic resources is correlated to poverty, and that aquatic resources constitute an important component of wider livelihood strategies (largely from the Mekong Delta). In many contexts, wild aquatic resources including non-fish aquatic animals are of particular importance in poor people's livelihoods.
- Many rural people who are dependent on wild capture fisheries are almost by definition to be considered poor. There is therefore considerable potential for addressing poor people through interventions directed at these fisheries, and considerable evidence from Asia of types of intervention that might be appropriate.

The Sustainable Livelihoods approach offers considerable potential for developing:

- Appropriate understandings of poverty, and for identifying the importance of aquatic resources in poor people's livelihoods. A means for bringing the poverty alleviation and aquatic resource sectors closer together in order to:
- Develop effective targeting,
- Devise appropriate interventions whether based on aquaculture or on wild fisheries management,
- Monitor impact,
- And on a broader scale for creating more responsive delivery institutions.

Lastly, not only is published information on livelihoods and poor people insufficiently detailed to understand the role of fisheries and aquatic resources in their lives (and the PRAs undertaken under this study and reported separately were intended to address this gap), but there is inadequate information on the trends and status of inland fisheries. A series of threats and policy issues have been identified, but these are most clearly articulated around more commercial enterprises such as shrimp farming and acidification of farmland. Policy makers have paid inadequate attention to floodplains and rivers and the many freshwater fishes occurring there and data on the productivity and importance of these resources as a whole and to poor people are simply lacking.

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