

31695

Vietnam

**Fisheries and Aquaculture
Sector Study**

Final Report

Ministry of Fisheries

and

The World Bank

February 16, 2005

CONTENTS

| | Page |
|---|-------------|
| Executive Summary | i |
| I. Fisheries Sector Trends and Current Status | 1 |
| A. Resources | 1 |
| B. Capture Fisheries | 2 |
| C. Aquaculture | 5 |
| D. Socio-Economic Aspects | 6 |
| E. Environment and Natural Resources | 10 |
| F. Development/Sustainable Management Opportunities and Constraints | 11 |
| II. Policies and Legal Framework | 16 |
| A. Fisheries Law, Policies and Decrees | 16 |
| B. International | 18 |
| C. Comanagement | 19 |
| D. Coastal Zone Planning and Management | 19 |
| E. Possible New Policy Directions | 20 |
| III. National and Local Institutions | 21 |
| A. Private Sector and SFEs | 21 |
| B. National and Provincial Institutions | 22 |
| C. Research and Education | 24 |
| D. Mass Organizations | 27 |
| E. Donor Programs, Projects and Cooperation | 28 |
| IV. Public and Private Sector Cooperation and Stakeholders | 29 |
| A. Public Commercial and Service Activities | 29 |
| B. Joint Public and Private Sector Activities | 30 |
| C. Non-government Organizations | 30 |
| V. Support Services – Constraints and Opportunities | 31 |
| A. Services to Capture Fisheries | 31 |
| B. Port Facilities | 31 |
| C. Aquaculture | 32 |
| D. Extension and Information | 34 |
| E. Fisheries Sector Credit | 35 |
| VI. Markets and Processing | 36 |
| A. Market Channels | 36 |
| B. Processing | 37 |
| C. Export Market Challenges | 37 |
| D. Future Demand and Price | 39 |
| E. Market Development Needs | 39 |
| VII. Development Priorities and Next Steps | 39 |
| A. Poverty and the Environment | 40 |
| B. Suggested Program Areas | 41 |
| C. Implementation, Coordination and Follow Up | 47 |

LIST OF TABLES

| | | |
|---------|---|----|
| Table 1 | Biomass and estimated MSY | 1 |
| Table 2 | Fishing gear usage | 2 |
| Table 3 | Sources of fisher household income 2001 | 6 |
| Table 4 | State and non-state fisheries enterprises | 22 |

LIST OF FIGURES

| | | |
|----------|---|----|
| Figure 1 | Mechanized fishing fleet 1991-2003 | 2 |
| Figure 2 | Proportion of fleet by engine size, 1992 and 2001 | 2 |
| Figure 3 | Marine capture fishery landings 1990-2002 | 3 |
| Figure 4 | Marine fish catch by region 1993-2003 | 3 |
| Figure 5 | Aquaculture area by region | 5 |
| Figure 6 | Fishing labor | 10 |
| Figure 7 | Volume and value of fishery product exports | 36 |
| Figure 8 | Fish export prices | 37 |

APPENDICES

Appendix A: Decree 106 on Coastal Communes facing Special Difficulties**Appendix B: Fisheries Sector Statistics****Appendix C: Persons and Institutions Consulted****Appendix D: Fisheries Law and Policy Framework****Appendix E: Marine Protected Areas – Current Status****Appendix F: Fisheries Sector and ICZM Projects****Appendix G: Main Fishing Grounds****Appendix H: Aquaculture Policies****Appendix I: Aquaculture Trends, Sectoral Analysis and Environmental Issues****Appendix J: Markets and Processing****Appendix K: Development Priorities and Follow-up Recommendations****Appendix L: Recommendations from MOFi Study Review Workshop -- August 31, 2004****Appendix M: Recommendations from the MOFi Workshop on
10-Year Investment Priorities -- October 28, 2004****ABBREVIATIONS**

| | |
|--------|---|
| ADB | Asian Development Bank |
| AIT | Asian Institute of Technology |
| BSP | Bank for Social Policy |
| CBD | Convention on Biodiversity |
| CIB | Commercial and Industrial Bank |
| CITES | Commission on International Trade of Exotic Species |
| DANIDA | Danish International Development Agency |
| DARD | Provincial Department of Agriculture and Rural Development |
| DFID | United Kingdom Department for International Development |
| DOFI | Department of Fisheries (provincial) |
| DOLISA | Department of Labor, Invalids and Social Affairs (provincial) |
| DONRE | Department of Natural Resources and Environment (provincial) |

| | |
|-----------|---|
| DOST | Department of Science and Technology (provincial) |
| DPI | Department of Planning and Investment (provincial) |
| EEZ | Exclusive Economic Zone |
| EIA | Environment Impact Assessment |
| EU | European Union |
| FA | Farmers' Association |
| FAO | Food and Agriculture Organization of the United Nations |
| FICEN | Fisheries Informatics Center |
| FIIP | Fisheries Infrastructure Improvement Project (ADB) |
| FSPS | Fisheries Sector Program Support (DANIDA/MOFi) |
| GSO | Government Statistics Office |
| GEF | Global Environment Facility |
| FINIDA | Finish International Development Agency |
| hp | horsepower of engine (= 0.75 kW) |
| ICZM | integrated coastal zone planning and management |
| IUCN | International Conservation Union |
| IFEP | Institute of Fisheries Economics and Planning |
| ITC | International Trade Commission |
| JICA | Japan International Cooperation Agency |
| MARD | Ministry of Agriculture and Rural Development |
| MOET | Ministry of Education and Training |
| MOFi | Ministry of Fisheries |
| MOLISA | Ministry of Labor, Invalids and Social Affairs |
| MONRE | Ministry of Natural Resources and Environment |
| MOST | Ministry of Science and Technology |
| MPA | marine protected area |
| MPI | Ministry of Planning and Investment |
| MRC | Mekong River Commission |
| MSY | Maximun Sustainable Yield |
| NACA | Network of Aquaculture Centers for Asia Pacific |
| NAFIQAVED | National Fisheries Quality Assurance and Veterinary Directorate |
| NGO | Non-government organization |
| NOAA | United States National Oceanic and Atmospheric Administration |
| NORAD | Norwegian Development Agency |
| OIE | Office International des Epizooties |
| OSH | Occupational Health and Safety |
| PC | Peoples Council |
| PL | post-larvae (e.g., of shrimp) |
| PPC | Provincial People's Committee |
| PDFRP | Provincial Departments of Fishery Resources Protection |
| PMU | Project Management Unit |
| PUA | Port User Associations |
| RIA | Research Institute for Aquaculture |
| RIMF | Research Institute for Marine Fisheries |
| SAPA | Sustainable aquaculture for poverty alleviation |
| SEAFDEC | Southeast Asia Fisheries Development and Economic Commission |
| SFE | State fishery enterprise |
| SPS | Sanitary and Phyto-sanitary |

| | |
|---------|--|
| TAC | Total allowable catch |
| UNEP | United Nations Environment Programme |
| VAC | Integrated pond fish culture with agriculture and animal husbandry |
| VASEP | Vietnam Association of Seafood Exporters and Processors |
| VBARD | Vietnam Bank for Agriculture and Rural Development |
| VINAFIS | Vietnam National Association of Fisheries |
| VNICZM | Vietnam Netherlands Integrated Coastal Zone Management project |
| VSP | Bank for Social Policy |
| WU | Women's Union |
| WSSV | White spot shrimp virus |
| WTO | World Trade Organization |

Executive Summary

Study Objectives

1. The study has two main objectives: (i) to review the status and needs of the fisheries, aquaculture and aquatic resource management in Vietnam; and (ii) to identify key areas of intervention that can reduce poverty, increase production and improve environmental management of the sectors on a sustainable basis.

Background and Status

2. The fisheries and aquaculture sectors are significant contributors to the economy of Vietnam. Direct production value (at the farm gate or on the wharf) in 2003 was approximately Đ25 trillion (\$1.7 billion) or approaching 4% of GDP. Available data show that the relative contribution from aquaculture represented about 60% of the revenue generated while yielding under 40% of the total catch from capture fisheries and aquaculture. Export earnings from fish, shrimp and other seafood products totaled about \$2.2 billion in 2003 of which 52% was shrimp. Both sectors have expanded rapidly over the past decade, with marine fisheries production rising from 800,000 to 1.5 million tons over the period 1990 to 2003. Aquaculture production has increased rapidly to around one million tons, while inland fisheries contribute in excess of 200,000 tons.

3. **Inshore fisheries** are considered by fishers and the government to be over-exploited, causing hardship for many coastal communities. Intervention is required to improve management and performance with regard to productivity and biodiversity conservation, and find alternative livelihoods for those unable to make a living from fishing.

4. **Offshore fisheries** have been strongly promoted by the Government since 1997. While the north (Tonkin Gulf) and west (Gulf of Thailand) fisheries appear to be over-exploited, the grounds in the east and south are becoming increasingly exploited and could have some scope to support additional fishing effort. However, few data are available on the resource or optimal sustainable yield. Until further research is completed, it is considered that inshore fishing effort should be reduced and offshore limited to approximately its present level. The rationale of containing expanded exploitation of those resources from the vagaries of continued unrestricted exploitation is by itself sufficient reason to give high priority to improving the currently rather ineffective sector governance and that the benefits of such a strategy would exceed the risks. Enforcement of the recently adopted Fisheries Law, particularly the decentralization of fisheries management and regulation, is a step specifically available to the government to take more effective action.

5. **Inland capture fisheries** landings are estimated at about 200,000 tons in official statistics - almost certainly an underestimate. Inland fisheries, particularly in floodplains and rice fields in the Mekong and Red river deltas, provide an important source of aquatic products for rural people's nutrition and seasonal income. Although there is a dearth of statistical data, several studies indicate that inland fisheries are of considerable importance for poor people in many parts of Vietnam, not only full-time fishers but also households that combine fishing as a component of wider livelihood strategies. Accordingly, a study by the Tropical Biology Institute of Ho Chi Min City documented annual yields in 2001 as high as 430 kg/ha from a 45,000 ha area in Can Tho and Kein Giang Provinces in the Mekong Delta. Considering that the Mekong Delta has a flooded area of about 1 million ha during the rainy season each year, the contribution from floodplain fisheries in that part of the country would far exceed the current estimate of inland fisheries in Vietnam.

6. **Aquaculture** has grown significantly in recent years, averaging over 12% annual growth since 1990. Aquaculture contributes more than 40% to total fishery production with a farm gate value in 2003 of \$15.4 trillion in 2003. In terms of production, the freshwater sub-sector remains dominant with approximately 65-70%. Brackish water aquaculture - mainly shrimp – contributes around 220,000 tons and more than 40% to the overall value of production. Crab farming and limited farming of marine fish and mollusks, in particular, provide the remainder.

Key Issues

7. **Coastal Management.** A number of innovations in coastal management have been initiated in the past few years including: (i) mangrove protection in the Mekong Delta, (ii) marine protected area development in Quang Nam, Khanh Hoa and Ba Ria-Vung Tao Provinces; and (iii) integrated coastal zone planning and management (ICZM) in Quang Ninh, Nam Dinh, TT Hue, Da Nang and Ba Ria-Vung Tau. However most coastal areas have not addressed issues over zoning and conflicts over resource use. Without a planning framework, coastal protection, conservation and allocation of areas for various uses (e.g., aquaculture, fisheries, tourism, transport, biodiversity conservation, industry, urban development and energy) can be significantly impaired. Wild and cultured living marine resources can be placed at high risk. Comprehensive coastal zone planning and management should increase economic performance and improve resource conservation. Under the new Fisheries Law, responsibility for allocation of sea areas for marine aquaculture and fisheries has been delegated to the provinces. Establishment of a coastal planning foundation by the provinces is required for this action to be effective.

8. **Fisheries.** The natural resource base, particularly in inshore fisheries, has been severely overexploited. Many high value fish resources have declined to a low level. Catches of lower value species have increased and these are also being depleted. Many fishers have abandoned inshore fishing or have resorted to catching small species with fine-mesh nets, mainly for fish sauce production. Offshore fisheries are fairing somewhat better, though generally declining nationwide. Some areas at present are still reporting reasonably high returns according to recent surveys. Nevertheless, some vessels are performing poorly and limit their fishing effort to peak catching seasons. Vessels financed under the Government's offshore fishing vessel subsidized credit scheme have performed poorly, with only around 10% meeting their repayment schedules. Repossession and reallocation of the poorly performing vessels is currently under way. The offshore fishery has the potential to develop into a sustainable fishery, but runs the risk of overcapitalization and over-fishing. Improved management is urgently required. Inland fisheries production is more limited and could benefit from the establishment of sanctuaries to protect critical natural habits, appropriate gear, and closed fishing seasons during the main spawning periods in selected areas as can offshore fisheries.

9. **Aquaculture.** Aquaculture is essential to meet future demand for aquatic products. While aquaculture has expanded to supply domestic and export markets, issues concern the available limited capacity in the country to promote and guide its sustainable development, in fresh, brackish, and marine environments. The main concerns are related to quality and sufficiency of seed and feed supply, disease control, and management of environmental impacts, including understanding of carrying capacity of sea and inland water areas, extension services, and marketing channels and quality control systems. More emphasis can also be placed on applying aquaculture for poverty reduction. Quality of the product has been a concern in some export markets and anti-dumping cases have revealed the vulnerability of the sector to external factors related to international trade.

10. **The marketing system** for fish and other products is generally competitive and efficient for the high-value products. Marketing relies on a large number of agents or product assemblers who provide fish to retail outlets, wholesale markets or processors. Market intelligence is limited and requires urgent improvement to assist producers in their investment and marketing decisions. Threats to the seafood market include anti-dumping tariffs on catfish and imminent tariff on shrimp designed to protect some

external producers and processors. Processors have done well in achieving certification for a range of products in the US, European and Japanese markets and seem set to expand their market share quite rapidly if permitted to do so. Traceability (e.g., for shrimp) is an issue which requires urgent attention if the European market is to be maintained or developed. The domestic market is less developed than the export market with inefficient and limited direct access to and knowledge of markets. Wholesale marketing capacity is highly limited with only two wholesale markets in Ho Chi Minh City, Long Bien and Phap Van markets in Hanoi. An analysis of the overall fish-marketing situation is warranted, including as assessment over whether the wholesale sector needs to be strengthened to promote competition and increase demand for fish, particularly from more remote inland areas.

Poverty and the Fishery Sector

11. Many millions of people throughout Vietnam depend in full or part on the country's aquatic resources. The Government 135 program for supporting the particular poor communes identifies 2369 communes in mountainous and remote areas and islands, from this, 2240 have received support from central Government and 129 support from provincial Governments. The extension of Program 106 to coastal communities has identified 157 communes special difficulties communes. (For a list, see Appendix A.) Despite the problems experienced by the inshore fishery, coastal areas are not impoverished to the same degree as many inland or mountain communities. Nonetheless there are poor communities in many coastal provinces, particularly in North-Central Coast and the sand zones of many coastal provinces. Within regions that are considered better off, there are pockets of poverty, e.g., in the Red River delta and Mekong regions, which, because of their very high population density, have the highest total numbers of poor of all of Vietnam's regions. Inland fisheries and aquaculture thus have clear potential to contribute to poverty reduction in the inland and mountain areas. Overall the fisheries sector has been inadequately represented in the nation's poverty reduction strategies, and stronger lobbying by fisheries sector institutions is desirable. Moreover, Government programs in the fisheries sector would greatly foster the Government priority of eradicating poverty through supporting programs that would generate employment, particularly for low-income households, while at the same time allowing market forces to guide the investments.

Policy and Legislation

12. Government policy and the new Fisheries Law enacted in November 2003 provide a good basic framework for inshore and offshore fisheries management, environmentally sustainable aquaculture development and poverty reduction in the fisheries sector. The Law is closely linked to MOFi's master planning activities. The immediate need now is to build capacity and enabling regulations and policies for effective implementation of the overall national policies and legislation. One aspect that has proven inefficient in many instances is the development of directed and subsidized credit programs that are thus not governed by market forces that tend to stabilize as well as direct investment to cost effective activities.

13. Vietnam's WTO membership, expected during 2005, will have important implications for the fishery and aquaculture sectors and the livelihoods of the people involved. The Sanitary and Phyto-Sanitary (SPS) Agreement will be a particular challenge. Progress made in adopting international sanitary standards in processing and exporting businesses is impressive. However, difficulties in complying with international standards are anticipated for the many small-scale farmers, fishers and processors involved in the sector. Further analysis of the WTO membership on the fisheries sector should be conducted to develop policy and practical measures to reduce risks for the small-scale sector.

Improving Fisheries and Coastal Management

14. In the final chapter of the report, four key areas for possible intervention and support by multilateral and bilateral agencies are defined: (i) Integrated Coastal Zone Management; (ii) Fisheries

Management in Inland, Offshore and Inshore Areas; (iii) Diversified Aquaculture Development in Brackish, Marine, and Freshwater Areas; and (iv) Marketing. It is intended that the “program elements” will be discussed and developed by MOFI in consultation other key stakeholders such as the provinces, fishers and aquaculturists (through the Vietnam National Association of Fisheries - VINAFIS) and processors (through the Vietnam Association of Seafood Exporters and Processors - VASEP). The central themes of the proposed fisheries sector interventions are poverty alleviation and environmental management. The two aspects are closely linked, since environmental sustainability is a key determinant of success in natural resources management. The government’s program to support the poor coastal and inland communes should be a central feature of any intervention. Thus provinces selected for focus will ideally contain a significant number of these communes. Moreover, the recent Fisheries Law will also assist in sustainable management and development of the aquaculture and fisheries sectors; and, for which, assistance will be required for its implementation, particularly with regard to the allocated responsibilities from the central to the provincial level.

Integrated Coastal Zone Management

15. Many of the aspects of development of the coastal aquaculture and inshore fisheries sectors should be carefully planned and implemented to protect the interests of all stakeholders in coastal development. This implies a need for integrated coastal zone planning and management (ICZM). Under any fisheries sector project involving coastal zone development, it will be desirable to work within an existing or develop a new ICZM framework for provinces currently without ICZM. A program would include such aspects as: (i) awareness raising and capacity building; (ii) provincial/regional ICZM strategy development; (iii) integrated development planning and zoning; and (iv) livelihood support. It is suggested that a program commence with a small number of pilot provinces, gradually expanding to cover all interested coastal provinces.

Fisheries Management

16. **Inshore Fisheries.** The Government has been responsible for Fisheries management in Vietnam. However, agencies such as the provincial Departments of Fisheries (DOFis) have lacked the resources of staff or budget to provide the required management, monitoring, surveillance or regulation enforcement in Vietnam’s inshore (or offshore) waters. With increasing population pressure and the development of more effective (and/or destructive) fishing gears, inshore resources have been increasingly over-exploited. In this situation, almost the only option for improved resource management is co-management, the sharing of responsibility for resources management between local communities and government agencies. The new Fisheries Law provides the potential for this. Some provinces have already initiated establishment of such systems, both through the national MPA program and on a smaller scale in mainland inshore waters in several provinces. Full co-management programs could be commenced in selected provinces, involving: (i) identification of stakeholders; (ii) research into current and traditional resources; (iii) boundary identification; (iv) development of community fishery management plans; (v) demarcation of co-management and MPA zones; (vi) support to communities, e.g., for livelihood development.

17. **Offshore Fisheries.** Vietnam has recognized the need to manage its offshore fisheries. To date, the offshore sector has been considered under-exploited, and therefore has not required intensive management. It seems that the offshore fishery is becoming increasingly over-exploited in most of the country’s EEZ. The rapid growth in offshore fishing from less than 1,000 vessels over 90 horsepower in 1997 to nearly 7,000 in 2004 means that careful management is essential. As fishing techniques become more sophisticated, the increased level of fishing effort may lead to further collapse of most of the fishery within 10 years, even if fleet size remains unchanged. It is therefore highly desirable to introduce necessary management measures before the collapse in those areas still reasonably productive, rather than attempt to rehabilitate a fishery after its collapse. For areas such as the Tonkin Gulf, a radical fisheries control and management program will be required for its rehabilitation. A recent Vietnam-China fisheries

agreement over the Tonkin Gulf is an important step in that direction. Definition of a detailed offshore fishery management program will require substantial research and analysis and, particularly, in depth consultation with the fishing industry. Steps required for effective offshore fishery management in Vietnamese waters might include: (i) definition and demarcation of fisheries in consultation with industry and research institutions; (ii) establishment of strategic, closed fishing seasons; (iii) introduction of a logbook scheme; (iv) introducing a license limitation program, at least until the fisheries and their status are better understood; (v) defining necessary fishing gear restrictions, including potentially restrictions specific to individual fisheries; (vi) assessing the potential for improved gear design; (vii) supporting development of VINAFIS; (ix) supporting the research needed for fishing ground and optimal gear definition; (x) implementing with China, the recent management plan for the Tonkin Gulf fishery; (xi) formulating plans for all of Vietnam's fisheries with emphasis on co-management; and (xii) assess methods for allocating rights based access to fisheries, including transferable licensing and individual transferable quotas.

18. **Inland Fisheries** are threatened by pollution including the use of agrochemicals and flood control projects that close off breeding habitats and nurturing grounds for resident and migrating fish and other aquatic species. These threats are particularly significant for poor households that depend on the fishery. Actions to assure the sustainability of inland fisheries include (i) further assessment of its importance to the national economy and local farmers and poor inland fishers in relation to trade-offs, such as flood control for agriculture; (ii) identification of appropriate management measures such as appropriate gear and closed-fishing seasons in selected areas; and (iii) establishment of sanctuaries to protect key breeding and nurturing habitats and sustain or improve productivity and biodiversity conservation.

Aquaculture

19. Aquaculture development is essential to meet anticipated future demand for aquatic products. It has potential to contribute significantly to rural poverty reduction in coastal and inland areas and is one of the few alternative livelihood options for many poor coastal communes. Key actions include: (i) supporting aquaculture as a livelihood option in agriculture diversification programs in inland areas, building on past experience, including ongoing World Bank and other rural poverty reduction projects; (ii) support a new initiative for diversified and integrated marine aquaculture as an alternative livelihood option for poverty alleviation, particularly for poor inshore fishers; (iii) improve environmental performance and adopt environmental guidelines for of aquaculture through wide-spread extension of better planning and farming practices, investment in infrastructure, improved service delivery and environmental rehabilitation and market incentives that reward better practice; (iv) diversify brackish water aquaculture as a lower risk option to coastal shrimp farming; (v) develop capacity and services to assist local farmers to improve aquaculture management ; (vi) develop systems and improve coordination of environment and disease surveillance and monitoring in coastal and inland areas in response to environmental and disease risks; (vii) define investment needs for quality seed production; (viii) strengthen communications and extension within the sector to share better practice experiences and coordination; and (ix) ensure greater stakeholder participation in policy making and planning, with special attention to participation of poor fishers and farmers.

Marketing

20. All fisheries and aquaculture under the market economy needs to be market driven. Marketing in Vietnam is reasonably efficient and low cost, particularly for export products though is generally considered weaker for domestically consumed products. A number of actions are desirable to improve fish product marketing. Some are discussed under the aquaculture component, such as establishing traceability and quality control systems for aquaculture export products as well as price monitoring and dissemination of market information to farmers and other stakeholders for effective decision-making. There is also need to explore whether support to the wholesale marketing sector could improve competition and prices for

producers and consumers, improve hygiene, and foster increased production and benefits to poor communities.

Implementation, Coordination and Next Steps

21. The above outlined program addresses a number of the management, environmental and poverty issues facing the fisheries sector. It needs to be reviewed, revised and endorsed by key stakeholders. It will then need to be formulated into a program that can be effectively implemented. Assuming that the program contains several of the elements discussed above, it is evident that it will involve a range of agencies and other stakeholders. Coordination in the design and implementation of the program will need to be of a high order, for example between several ministries, other stakeholders, including the private sector and mass organizations directly involved in the sectors and, at the provincial level via the Provincial People's Committees.

22. Given the complexity of the program, it will be desirable to implement it in a phased manner. Initially some of the concepts (for example of co-management and establishment of closed seasons and new protected areas) should be initially trialed in a few communes in each target province. This would allow the necessary research and development to be completed before attempting wider implementation. Priority in ICZM, aquaculture and inshore co-management would be given to poor communes. However, it is important that pilot areas chosen that have strong local commitment and ownership, as well as the technical capacity that are necessary for success.

23. As recommended by the study team, the Ministry of Fisheries should take the lead in formulating a program of support to the sectors' development. As the sector has strong linkages to other Ministries and agencies working in agriculture, rural development, poverty alleviation and the environment, the study team proposed the establishment of a fisheries sector steering group to assist in formulating the program and its coordinated implementation. This fisheries sector steering group may be organized as a branch of the ISGE under the Ministry of Natural Resources and Environment (MONRE), since this is already established and operates effectively. The ISGE already has an ICZM group. It will also be essential to link the program closely with donors working in fisheries and related sectors, including the DANIDA Fisheries Sector Program Support Phase 2 in particular, which is currently under design.

I. Fisheries Sector Trends and Current Status

Resources

24. Vietnam has a land area of 329,200 km² and an exclusive economic zone of about 1 million km². Its sea areas are divided into a number of regions as shown in Table 1. Current fish stock estimates total almost 4.2 million tons and Maximum Sustainable Yield (MSY) 1.67 million tons. Biomass has recently been re-estimated. Although the data have yet to be made official by MOFI, it is likely that biomass estimates will be reduced to around 3 million tons and MSY to 1.4 million tons. The official estimates of marine fisheries resources are included in Appendix B.

25. The sea area of Vietnam can be divided into four main regions namely northern, central, southeast and southwest. Fishing activities are classified as in-shore or offshore based on the depth of the sea in each region. A depth of 50m and 30m is used for the central sea region and the other regions, respectively. There are two main fishing seasons – the south season (from May to October in the north and July to December in the south) and the north season (from November to April in the north and January to May in the south) corresponding to the SW and NE monsoons respectively (FICEN). The central coast region and particularly the north central coast from about Thanh Hoa to Quang Ngai, is subject to typhoons originating in the western Pacific during the southwest monsoon period. Other parts of the country also experience typhoons, but rarely. Typhoon Lynda that killed 3,000 fishers off Ca Mau in 1997 was one of the only typhoons to hit the south in living memory.

26. Vietnam has a dense river network, including 2,360 rivers with a length over 10km. Eight have large basins with catchments of more than 10,000km². This river network includes many international rivers that originate in other countries. About two thirds of Vietnam's water resources originate outside the country, making Vietnam susceptible to water resources decisions made in upstream countries. The total area in- and outside Vietnam of all international catchments is close to 1.2 million km², which is approximately three times Vietnam's land area. Total annual runoff is 835 billion m³ but water shortage is aggravated in the 6-7 month dry season when the runoff is only 15 to 30% of this total. (MONRE 2003)

27. The total water surface potentially available for aquaculture, freshwater capture, or culture-based capture fisheries has been estimated at 1.7 million ha (FICEN). Of this total, around 120,000 ha are small ponds, lakes, canals, gardens; 340,000 ha are large water surface reservoirs; 580,000 ha are paddy fields which can be used for aquaculture purpose, and 660,000 ha are tidal areas. These figures do not include the water surface of rivers and about 300,000 - 400,000 ha of straits, bays and lagoons along the coast.

28. Mangroves are central to the sustainability of many of Vietnam's fisheries, though the provision of habitat to coastal and marine fish and crustacea. It is therefore of concern that Vietnam's mangrove forests have been significantly degraded. According to the Ministry of Agriculture and Rural Development (MARD 2004), since 1943 the national area of mangrove forests has declined from 409,000 to about 155,000ha. However, mangrove clearing is now being more strictly controlled. This combined with replanting programs in all regions appears to have arrested the decline over the past two years. The issue of the Government decree on the Conservation and Development of Wetland Areas by the Prime Minister, and the "Strategic Action Plan on the Conservation and Sustainable Exploitation of Wetlands to 2010" from the Ministry of Natural Resources and

Table 1. Biomass and estimated MSY

| | Fish stock 000 tons | TAC 000 tons |
|------------------|------------------------|-----------------|
| Tonkin Gulf | 681.2 | 272.5 |
| Central Region | 606.4 | 242.6 |
| South Eastern | 2075.9 | 830.5 |
| South Western | 506.7 | 202.3 |
| Sea mounts | 10.0 | 2.5 |
| Total sea area | 300.0 | 120.0 |
| | 4180.2 | 1670.4 |
| Small pelagic | 1730.0 | 694.1 |
| Demersal <50m | 597.6 | 239.2 |
| Demersal >50m | 1542.6 | 617.1 |
| Deep sea pelagic | 300.0 | 120.0 |
| Total | 4180.2 | 1670.4 |

MSY = maximum sustainable yield,

TAC = total allowable catch

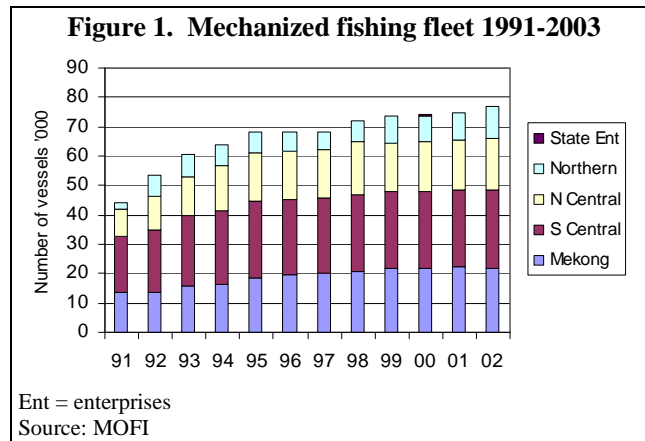
Source: Fistenet based on RIMF 1997 estimates

Environment (MONRE) should provide impetus and guidance for policy makers, managers and researchers for conservation and sustainable use of mangrove wetlands. The ongoing World Bank-funded Coastal Wetlands project is protecting and developing mangrove forests in the four Mekong Delta provinces of Ca Mau, Bac Lieu, Soc Trang and Tra Vinh.

Capture Fisheries

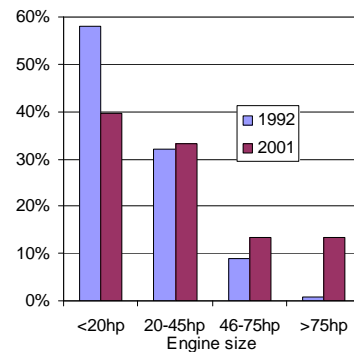
Fishing Fleet

28. The number of mechanized vessels has increased rapidly from 44,000 in 1991 to 77,000 in 2002 (by an average of 4.6% per year). The average power of the vessels has increased by 12%/year to reach 48 horsepower (hp) by 2002. The engine power of southern vessels averaged over 90hp, compared to 30hp for the rest of the country. Of the mechanized vessels, almost 7,000 are classed as “offshore” with engines of over 90hp. Notable has been the decline in the number of vessels owned by the state enterprises to 44 by 2002.



29. The average size of mechanized vessels has increased rapidly as shown in Figure 2. In 1991, only 10% of mechanized vessels exceeded 45hp, increasing to 27% in 2001 and more than 30% in 2004. The main increase in size class has been in the over 75hp and 46-75hp classes. Vessels with engines less than 20hp declined from almost 60% of the fleet to 40% in 2001. The offshore fleet is generally classified as including vessels with engines exceeding 90hp of which there are now around 6,000. Expansion of the offshore fleet has been government policy for several years, promoted since 1997 by a government subsidized-interest scheme. This has financed construction of 1,300 offshore vessels. However, many have been experiencing problems as discussed on page 17.

Figure 2. Proportion of fleet by engine size, 1992 and 2001



Source: Fisheries Master Plan

30. There is little information on the number of vessels using different fishing gears. Data from the 2000 census for all vessels are listed in Table 2, together with team estimates for 2004. Among the main gears, trawling (both pair and single) predominates in the south with around 40% of vessels. Drift gillnetting is more important in the north, while fixed nets are concentrated in provinces with substantial estuaries – e.g., Tra Vinh and TT Hue. It is notable that in Tam Giang lagoon in TT Hue, DOFI and the provincial government are making strong efforts to reduce both set netting and trapping, both of which are environmentally damaging.

Table 2. Fishing gear usage

| Gear | 2000 | 2004 estimated |
|----------------|-------|-------------------|
| Drift gillnet | 24.5 | 25 |
| Trawl | 22.5 | 18 |
| Hand/long-line | 19.7 | 25 |
| Purse seine | 7.7 | 10 |
| Lift net | 7.8 | 7 |
| Fixed net | 7.5 | 7 |
| Other | 10.3 | 9 |
| | 100.0 | 100 |

Source: Fisheries Master Plan & team estimates

Marine Fisheries Production

General production trends

31. The marine fisheries sector in Vietnam has developed rapidly over recent years, as shown in Figure 1 and detailed in Table 1-1, Appendix B. Total landings increased from around 0.5 million tons in 1980 to 800,000 tons in 1990 and 1.5 million tons in 2002. Fish landings have increased at 5%/year, crustaceans at 10%/year and mollusks by an average of 16%/year from a low base.

Inshore Fisheries

32. There is an ancient tradition for both collecting and capturing fish direct from the beach or in shallow mangroves, estuaries, lagoons and river deltas, helped by the influence of tidal water. A variety of simple, as well as sophisticated, fishing gear is used for capture of all kinds of fish and shellfish species. This provides a substantial amount of protein to the coastal population. Due to the increase in human population, there is great pressure on these resources. Exact data are not available, but estimates can be drawn from behavioral analysis. According to these estimates, in addition to the 8 million people whose livelihood depends on these fisheries as the household primary income source, there are an additional 12 million who get part of their income or subsistence from fisheries.

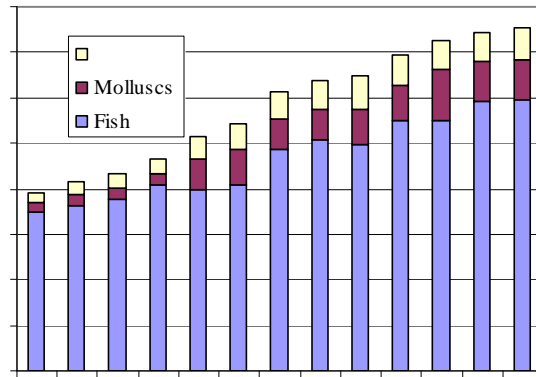
33. The inshore fishery (often up to 4-5 miles from the coast) depends on a fleet of about 28,000 non-mechanized canoes and boats, and approximately 45,000 smaller mechanized boats with long-tail or one-cylinder diesel engines up to approximately 20hp. Almost all of these vessels operate directly from the beach or estuaries and do harbor facilities. The most popular fishing gears are gill net, long-line, lift-net, push net (illegal) and traps. Statistics covering these gears are approximate since landings can take place nearly anywhere along the coast. Most landings are consumed locally or sold in local town and village markets, but high-value species such as crab are often sold to professional dealers and factories.

Regional Trends

34. Marine capture fisheries production by region since 1993 is summarized in Figure 4. Of total marine capture landings in 2003, the south contributed 55%, south central 28% and north central 11%. Overall, production has increased at an average rate of about 6%, though growth in north central and north have been fastest.

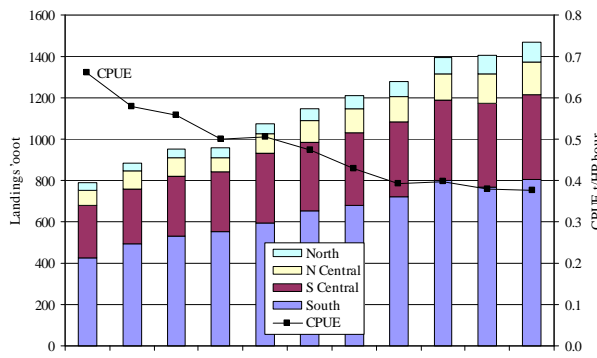
35. There is no single accurate measure for assessing the productivity of the marine fishing fleet in Vietnam. The measure most commonly used is catch per horsepower for the mechanized vessels which is not accurate particularly during a period of rapid mechanization and increase in power. Nonetheless,

Figure 3. Marine capture fishery landings 1990-2002



Source: FAO FishStat (MOFI data)

Figure 4. Marine fish catch by region 1993-2003
(‘000t fresh weight)



Source: MOFI

catch per unit effort has declined from 0.7 t/hp/y in 1993 to about 0.4 t/hp/y in 2003, indicative of quite a rapid decline in productivity in relation to unit effort.

Trash Fish Landings

36. A number of the fishing gears used in Vietnam result in high catches of trash fish. Trawlers (single and pair) typically land between 50 and 70 percent of non-table species of fish, which are used (i) for direct feeding to fish or livestock; (ii) in the manufacture of fish sauce or fish meal or (iii) for conversion into fish sauce. Edwards (2004) estimated trash fish landings at 33 percent of total marine fish landings. Southeast region accounted for two thirds of production. Southern fisheries had the highest proportion of trash fish (averaging around 60% of the catch), compared to 5% in central, and 14% in northern regions. Quality is often poor, since salt is usually used for preservation as opposed to ice. However, as demand for trash fish has increased and price has risen, often to Đ2,500/kg or more, trash fish landings have become a significant source of income for many fishers. Trash fish landings are likely to increase in the future, unless trawl net designs are modified to reduce catches of small fish.

Live Reef Fish

37. Live reef fishing is a significant sector, but few data are available on production, either of aquarium fish or of live reef fish for the China market. According to IMA (2001), the main species targeted include groupers, snappers and lobster, either wild caught, or wild caught and grown in cages. Main production areas include northern and central region (Khanh Hoa and Phu Yen). In the North, the main collection and trade areas are located in Quang Ninh and Hai Phong. In Quang Ninh Province, four areas, Coto Island, Thuong Mai Island, Ha Mai Island and Halong City are deeply involved in the trade. In Hai Phong province, Cat Ba Island and Bach Long Vi, both proposed marine protected areas, are the major collection centers. Most reef fish are exported live, often unofficially through transfer to Chinese vessels at sea, at Co To Island, Cat Ba port and other locations.

Leasing of marine fishing rights to foreign fleets

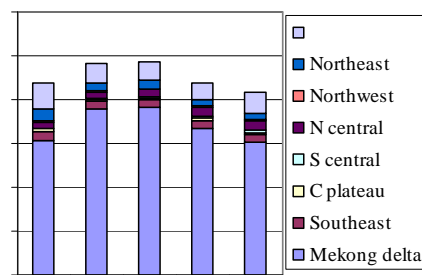
38. In principle, Vietnam permits joint ventures for fishing activities within its Exclusive Economic Zone (EEZ). However, there are no current agreements for fishing, though there are agreements with Chinese and Korean companies for purchasing of fish and other products.

Inland Fisheries

39. In the past, freshwater capture fisheries were important for the economy in many regions. During the 1970s there were more than 70 fishing cooperatives with annual production of several thousand tons. However, overexploitation led to a reduction in the resource and the end of operation for most cooperatives with fishers converting to other activities.

40. Inland (river, lake, dam and rice field) fisheries remain important for rural dwellers in many inland areas. The main data source for inland data are the Government Statistics Office (GSO) statistics that suggest a peak of 244,000 tons in 2001, declining to 209,000 tons in 2003, probably due to drought. Inland capture fishery landings include culture-based-capture, through the stocking of lakes, dams and other inland waters, mainly with carp and tilapia. However, the FAO fish consumption survey (Lem 2002) identified freshwater fish consumption averaging 14 kg/person or 1.1

Figure 5. Inland capture fisheries production



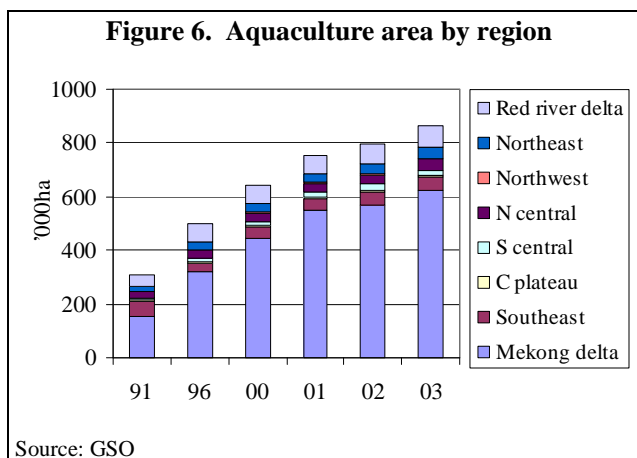
Source: GSO

million tons. The difference is likely to be due inclusion of aquaculture products in the FAO survey and likely underestimation by the GSO, a feature common to most inland fisheries statistics of the Mekong region (FAO/MRC 2003).

41. Vietnam's rivers are generally quite productive. The Mekong River for example provides more than 30,000 tons of fish annually, landed by around 48,000 fishers in 250 communes (MOFI Master Plan)¹. However, the Red River delta in the north, which was once highly productive, is now almost devoid of fish, due to extensive flood control and the closure of flood plain fish breeding and nursery areas.

Aquaculture

42. Aquaculture production according to FAO statistics (provided by MOFI) has grown at 12%/year since 1990 with freshwater and marine production showing the highest growth rates (of 13 and 17% respectively). Total aquaculture production in 2003 is estimated as 966,100 tons², contributing more than 40% by weight to total fishery production, with a farm gate value in 2003 estimated as Đ15.4 trillion. The freshwater sub-sector remains dominant, contributing 65-70% of total production. Brackish water aquaculture, mainly shrimp, contributes around 220,000 tons of production and more than 40% to value, with the remainder coming from crab and lobster farming and limited fish and mollusk aquaculture in marine areas. Total aquaculture area according to GSO is 865,500 ha (Figure 5). Growth since 1991 has averaged 9% compound. The Mekong delta dominates area and production, although, aquaculture is expanding in all regions.



Regional trends

43. **North coast**, with the five coastal provinces of Quang Ninh, Hai Phong, Thai Binh, Nam Dinh and Ninh Binh, has well developed freshwater, brackish water and marine aquaculture, with potential for further development. Cage culture of marine fish is developing quite rapidly in Bai Tu Long and Ha Long bays, two areas of outstanding natural beauty. The region also produces mollusks, crabs, seaweeds and shrimp (*Penaeus monodon* and recently the exotic *P vannamei*). The region has 52 small freshwater hatcheries, about 30 shrimp hatcheries and several marine fish hatcheries.

44. **Northern inland and Red River areas** comprise 14 northern mountain provinces and 6 inland provinces in the Red river delta, including in the mountain areas some of the poorest and remote regions in the country. Aquaculture in the Red river delta provinces in particular has expanded in recent years, from 13,300 tons in 1990 to 76,400 tons in 2003. The traditional polyculture and integrated farming system ("garden-fish pond-livestock pen" termed VAC) is common in the region. Fish cage culture has been widely practiced in many mountain provinces, mainly involving grass carp, but disease outbreaks have seriously constrained this type of aquaculture. Small-scale pond farming has shown considerable promise for poverty reduction in northern mountain areas, including among

¹ The Tropical Biology Institute has documented fish production levels as high as 430 kg/ha/year for large seasonally flooded areas in the Mekong Delta. However other estimates from Vietnam and the region indicate landings generally between about 50 and 80 kg/ha per flood season.

² Aquaculture statistics are from GSO, 2004. There are discrepancies in the statistics from GSO and MOFI.

ethnic groups. The Red River delta provinces have a strong fish hatchery and nursery network with more than 100 hatcheries of all sizes.

45. **North Central coast** has 6 provinces covering 600 km of coastline, from Thanh Hoa to Thua Thien Hue Province. The region is characterized by long sandy beaches and a narrow coastal plain (mainly rice fields), with mountains to the west. Aquaculture has been expanding, to 46,000 tons in 2003, double the level of 1999. There are 25 small-scale hatcheries that meet 50% of the demand, limiting freshwater aquaculture in remote western mountain areas. *P monodon* production in the region is increasing, reaching 9,300 tons in 2003. Shrimp hatcheries in this region can meet only 25-30% of demand, the rest met by import from other provinces.

46. **South Central coast:** also has a coastline of about 600 km and considerable climatic and geographic advantage for brackish water and marine aquaculture. Shrimp farming is dominant with a production of 15,500 tons in 2003, or 78% of total aquaculture production of the area. Freshwater fish farming plays only a minor role. Marine mollusks are also of limited production, although pearls, mussels, abalone, scallops and *Babylonia* are cultured. Marine cage culture of groupers, and recently *Cobia*, is found in this region, and there has been recent foreign investment in marine fish cage culture and hatcheries in Khanh Hoa. The region is the largest lobster producer in Vietnam, with a reported 17,000 cages producing about 1,500 tons of lobster in 2003. This region is also the largest producer of shrimp seed in Vietnam with 2,700 shrimp hatcheries/nurseries, contributing about 35% of national shrimp seed production.

47. **Southeastern region:** Aquaculture development in this region is very diverse, and expanding. The production has grown very quickly from 6,400 tons in 1990 to 48,000 tons in 2003. Mollusk farming, shrimp culture, lobster and marine fish farming are important aquaculture activities here. Shrimp makes the largest contribution with 14,800 tons in 2003. Cage culture is also growing. There are 1,600 shrimp hatcheries producing about eight billion *P monodon* post larvae for local use and export to provinces in the North and Mekong delta.

48. **Mekong delta:** The Mekong delta provinces from Long An to Ca Mau and along the west coast to Kien Giang contribute the largest volume and value to Vietnam's aquaculture production. Aquaculture in the Mekong Basin is a diverse activity. It encompasses breeding, rearing and sale of shrimp, freshwater prawn, mollusk and fish fry and fingerlings, and growing of wild or hatchery-reared fry and fingerlings in enclosed or semi-enclosed water bodies, such as ponds, rice fields, mud flats and cages, in inland and brackish water areas. According to GSO data, total aquaculture production in 2003 was 324,400 tons, from a culture area of 616,600 ha. More information on aquaculture in the Mekong delta and other regions of Vietnam is provided in Appendix I.

Socio-Economic Aspects

The Household and Household Groups

49. The household remains dominant in both capture fishing and aquaculture. In 2001, fisheries represented the main business of 4.3% of households and the primary employment of 5.1% of the national labor force (GSO 2001). Levels were highest in South Central Coast (9.9% and 11.3%, respectively) and Mekong Delta (9.1% and 9.8%). Most fishers and aquaculturists are small-scale producers – 77% of households conducting aquaculture have under 0.1ha of pond area and another 7% from 0.1-0.2ha.

Table 3. Sources of fisher household income 2001

| | Fishery | | | | Agriculture | Forestry | Industry | Other |
|---------------------|-------------|---------|----------|-------|-------------|----------|----------|-------|
| | Aquaculture | Capture | Services | Total | | | | |
| South Central Coast | 35.7% | 45.5% | 0.3% | 81.5% | 3.3% | 0.3% | 3.5% | 11.3% |
| Mekong River Delta | 53.7% | 21.2% | 0.9% | 75.7% | 7.1% | 0.7% | 5.8% | 10.6% |
| National | 40.5% | 34.9% | 0.6% | 76.0% | 6.4% | 0.5% | 5.3% | 11.8% |

Source: GSO Rural, Agriculture and Fisheries Census 2001 (2003), tables 6.6 & 6.12

50. As many households lack direct connections to markets, private collectors and small traders play an important role in marketing and distributing raw fishery products, including supply to processors and exporters. The collectors and traders often provide credit and supplies to households, thereby supporting production in a quite efficient manner. However, the many stakeholders and fragmented market chains may in future prove a constraint to traceability, and other increasingly stringent international market requirements.

51. Fishing and aquaculture contributes an average 75% of fisher household income. Those in the South Central Coast are particularly dependent on marine fishing. Households commonly lack access to formal credit and other fishery support services, such as high quality seed and fingerlings, professional extension, disease control and market information. As opportunities of other sources of income are quite limited, labor migration to other areas is common, including work on foreign fishing fleets, including Korean, Japanese and Taiwanese. There are some initial forms of association among households, e.g., credit group and cooperative groups, which associated about 21,000 fishers in 4,300 cooperative groups in 2000 and has subsequently grown significantly.

Marine Fisheries

52. The completion report for the ADB-supported Fisheries Infrastructure Improvement Project (FIIP) found quite strong positive socio-economic benefits associated with port development (ADB 2004). The crew on mainly offshore vessels of between 50 and 400 hp surveyed in Song Gianh (Quang Binh), Phan Thiet (Binh Thuan) and Tac Cau (Kien Giang) were earning an average monthly income of around Đ2 million – or around three times as high as the official (MOLISA) poverty line. The majority of fishing vessels were reported to have been fishing effectively and on average demonstrated high returns to capital (averaging around 50%). All three ports but particularly Phan Thiet and Tac Cau had vibrant support sectors, with substantial current or planned construction of processing plants and other support services. Of the entire fleet of around 7,000 vessels of over 90 hp, around 60% are estimated to be highly profitable, mainly in southern Vietnam, a further 20% make small profits, while the balance breakeven or lose money. In practice, it is not possible for Vietnamese fishing vessels to lose money for extended periods, as both owners and crew require money to live. Thus a loss-making vessel is likely to be sold or scrapped relatively quickly.

53. The FIIP results closely reflect the survey results of the Institute of Fisheries Economics and Planning (IFEP) of MOFI. A survey of 353 vessels in October 2001 in the three northern provinces of Hai Phong, Thai Binh and Nam Dinh defined household income levels for mechanized vessels in four size classes from “less than 20hp” to “over 90hp”. Overall, the mechanized vessel owners were generally relatively affluent, with 77% of households owning mechanized vessels reporting income of more than Đ250,000/month per person in 2000. Households with vessels less than 20 hp were the least well off, with 7% reporting incomes less than Đ100,000 per person per month. A survey of fisher households in 2003 also by IFEP indicated that 72% of fishing households considered that they were better off financially than five years earlier, while 13% reported no change and 15% considered themselves worse off. Although the level of poverty is relatively low among boat-owning households, it is expected that a higher proportion of crew, particularly from inshore boats, or boats working seasonally will experience serious poverty at some times of the year. Overall the percentage of households owning fishing vessels classified as poor on the MOLISA standard is around 2% compared to the national average of 17%.

Inland fisheries

54. Inland (and coastal) aquatic resources are important for the poor in Vietnam (DFID, 2001; Nhi & Guttman, 1999a, 1999b). Historical evidence reviewed by DFID (2001) indicates that those most dependent on aquatic resources are people who have been displaced from land-based agricultural activities, and this is especially true in coastal areas. 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 important for particularly poor and vulnerable groups; though an even larger but significantly less visible number of poor people may depend on inland capture fisheries as a component of wider livelihood strategies (DFID, 2001). The role of inland capture fisheries is clearly illustrated in Tay Ninh province and Long An province in southern Vietnam (Nho and Guttman, 1999a and 1999b) through case studies on the role of aquatic resources according to economic status. The studies indicated that most households were involved in some form of capture fisheries, but that fishing is of greatest importance to poorer households. Within the poorest groups (with “very low income”), 88% of households fished.

Aquaculture

55. The spectrum of people involved in aquaculture is wide, and includes low-income poor people, as well as the better off with more assets to invest. For the better off, aquaculture can offer a lucrative return on investment, as can be seen, for example, in freshwater catfish cage farms and shrimp farms. Small-scale rural households in Vietnam dominate aquaculture producers though, often integrated within agriculture farms. A study of 1,261 farmers conducted by MARD in 2002 for example showed that 21% of agriculture farmers in the Mekong Delta undertook aquaculture, and 13% in the Red River Delta (MARD/UNDP, 2003). Aquaculture was less common on farms on other regions, but is expanding in all regions.

56. Aquaculture can provide a wide diversity of livelihood activities. People may be involved in the supply of inputs, such as fish seed, feed, and chemicals, extension, labor and other services and in post-harvest activities, such as trading and processing. In the Mekong Delta, for example, factories processing river catfish fillets for export provide employment for a many women, often from poor rural areas (Tung &Phillips 2004). Even though some assets are needed to invest in aquaculture production, poor and landless people can become involved and benefit from well-targeted aquaculture interventions. Success stories from poor households are often reported. The Hmong family of Ms Hoang Thi Mai, from the mountainous Lai Chau province is one well-known example of where aquaculture lifted a household from poverty (Ms Thi was awarded a UN "Race Against Poverty" award in 1997. Studies conducted for the World Bank Coastal Wetlands project show improved income among poor people in Soc Trang, Bac Lieu and Ca Mau provinces (Can Tho University, 2004) conducting small-scale brackish water farming, particularly of mangrove crabs.

57. In Vietnam, there are few cultural constraints on women’s participation in aquaculture; and men, women and children are involved in various activities. Women are particularly active in routine feeding, fertilization, and harvesting for consumption, trading and marketing. Moreover, experiences with the Mekong River Commission (MRC) Rural Extension for Aquaculture Development (READ) project in the Mekong Delta indicate that the role of women is greater in poorer households, where men often have to work away from home on a seasonal or daily basis (Phillips 2002). In some areas, the distance of the aquaculture operation from home may also become a constraint, as domestic chores may conflict with the requirements for fish feeding and management.

58. Although aquaculture does contribute to poverty eradication, a major impediment to poor people’s entry to aquaculture is the lack of targeted service support (AusAID, 2004, Oxfam, 1999). Studies in Tra Vinh (Oxfam 1999) show wealthier households engaging in shrimp production as they have access to suitable land, but also because they have ‘connections’ that allow them to gain easier access to financial capital (World Bank/DFID 1999). In the longer term, this is likely to lead to increasing inequality. As diversification generates greater wealth for some rural people, the gap between those who are able to diversify their production and those who are not inevitably widens. There is some indication that in the more intensive aquaculture production systems such as coastal shrimp farming that inequality has intensified, with wealth from shrimp production being concentrated in a few hands competing over finite coastal resources leading to some displacement of poor people (Adger 1998, Oxfam 1999). In marine cage culture there are also reports of competition between

artisanal fishers and aquaculturalists claiming the same water areas (Aasen 2000). Such problems should not detract from the considerable potential that aquaculture has for poverty reduction in Vietnam, but do emphasize the need for a targeted approach.

59. To date, the approach to aquaculture development has emphasized increasing aquaculture productivity, but such production and technology-oriented approaches have not always focused on poor people. In some cases, such an approach may even disadvantage the poor (Haylor 2001). Projects in Vietnam over the past few years demonstrate that a focus on the participation of poor groups in aquaculture can make significant contributions to improving rural livelihoods. Technologies for small-scale aquaculture that seem to work best for poor rural households require low investment, involve little risk and provide quick returns. They should be simple, easy to copy and extend and contribute to local fish supply. These aquaculture technologies may include ponds, nursing of fish in hapas (fine mesh net fish cages) in common water bodies, and raising of fish or crabs in rice fields (DFID 2001).

Poverty Reduction Programs

60. Vietnam's Comprehensive Poverty Reduction and Growth Strategy (CPRGS) was published in May 2002. The document provides a valuable framework for further reduction in Vietnam's poverty levels over the period to 2010 and beyond.³ Fisheries and aquaculture are seen as having a major role to play in national poverty reduction programs. The strategy suggests that there is significant growth potential in aquaculture and offshore seafood exploitation, and identifies intensive aquaculture and fishing playing an important role in accelerating economic growth and poverty reduction. The CPRGS includes reference to the following supporting activities:

- planning and construction of dykes, water inlet sluices and channels; provides public goods such as extension services, quarantine, quality control for breed and feed in order to help farmers increase production efficiency and achieve sustainability;
- investing to support fishery infrastructure, power transmission lines, roads etc in aquaculture areas that are either newly established or converted from rice or salt production;
- building six national breeding centers, and environment alert centers in specialized aquaculture areas in the North, the Center and Mekong River Delta;
- ensuring that by 2005, the area for aquaculture production is about 1.2 million hectare, with total production volume of approximately 2.6 million tons, of which shrimp production amounts to about 300,000 tons;
- ensuring the sustainability of the growth of aquaculture production; and
 - improving the access of poor fishery households to production inputs, information, extension services, credit and markets

61. The Government enacted Decision 106/QD-TTg dated in June 2004, approving the list of communes facing special difficulties along the coast and on islands. (For a list, see Appendix A.) Following this decision, 157 communes in 21 provinces have been included on the list and will be supported from a special fund established under Decision 106QD-TTg of July 1998. The support for each commune amounts to Đ500 million annually for upgrading infrastructure as proposed by the Commune People Council and approved by the provincial government. For the coastal communities program, the support fund can be used to improve the production infrastructure such as roads or the

³ Under Part IV: *Major Policies and Measures for the Development of Sectors and Industries to Ensure Poverty Reduction and Sustainable Growth Agriculture and rural development*: objectives include to: "ensure food security; diversify agricultural production; attach importance to market research and ensure timely provision of information; increase investments in agriculture; link the production of high value crops to developing storage and processing facilities; promote research and efficient use of natural resources; expand agricultural, forestry, fishery activities and extension activities in a manner that is suitable to production conditions in different areas and is responsive to the demand of poor people; develop fisheries and diversify aquaculture; develop a disaster prevention strategy to minimize losses and stabilize livelihoods and production in disaster-prone areas."

irrigation system in aquaculture areas. The wider 135 program has been extended to 2,369 communes, mainly in mountain areas.

62. Although the fishery and aquaculture sector is important in the livelihoods of poor people in Vietnam, the involvement of MOFI in formulation of policy to implement poverty-oriented programs in the fishery sector has been fairly limited. Only recently, was the “Sustainable Aquaculture for Poverty Alleviation (SAPA)” prepared by Ministry of fisheries and approved by correspondence 321/CP-NN in 2001 and Decision 657/2001/QĐ-BTS. This policy provides the basis for implementation of more targeted interventions for poverty reduction in the fishery and aquaculture sector.

Fishing Labor

63. The fisheries sector is a major employer, both directly through employment on boats and farms, and indirectly in upstream and downstream activities such as processing. Direct employment in the sector is estimated at 555,000, at present and has been growing at around 26,000 per year (Table A-3 in Appendix B). Total employment including aquaculture and the services sector is likely to exceed two million.

64. Few women are involved in fishing operations. Dang & Ruckes (2003) found that only 1.4% of fishing workers are women, and these are all shore-based. However, women often own fishing vessels or fleets and some of the larger private fleets based in Kien Giang for example are owned and managed by women. Women are employed for the preparation of materials for fishing trips, for gear repair, sorting fish landed and fish retailing in local markets. In the Mekong delta, almost 90% of agents/traders are women.

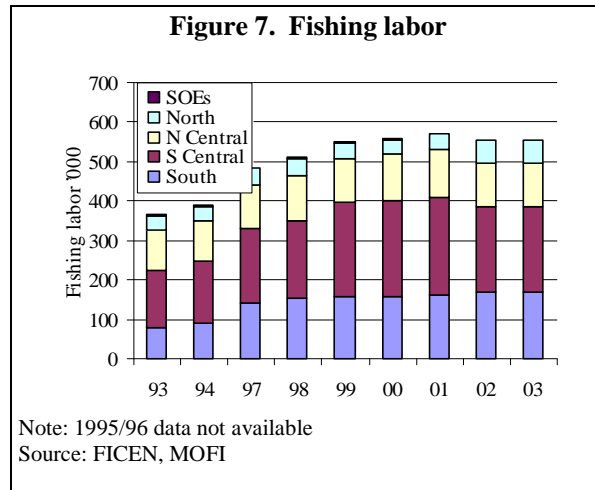
65. From interviews during the study, it was reported that processors employ an average of almost 300 people, of whom 80-85% are female. Processors interviewed during the sector study indicated that women similarly dominated management positions. Employment in the export-processing sector totals at least 65,000 people (VASEP). Processing jobs are valuable to communities (e.g., to the Khmer community in Soc Trang, which experiences widespread poverty). A 1997 survey of 196 fish processing establishments (Nguyen The Cong 1997) found, while the benefits of the increased economic activity are substantial, fish processing work carries a number of potential long-term health risks to its workers which are a characteristic of the industry worldwide. While the problems are likely to be particularly severe in older plants, they also occur in modern plants such as the shrimp processing facilities established in the Mekong Delta in the last decade, though improvements continue to be made. Many workers remain employed for 10-15 years.

Environment and Natural Resources

66. The fishery sector, including capture fisheries and aquaculture, is both affected by man-made or natural environmental change, and may impact either positively or negatively on the environment.

Fisheries

67. The geography and topography of Vietnam makes the country highly vulnerable to natural hazards. Each year, natural disasters such as typhoons, storms, floods or drought have severe effects on people, their livelihoods, agriculture land, livestock and infrastructure (Vietnam Environment



Monitor 2003). People engaged in the fishery sector are particularly vulnerable to such events, including some of the poorest and most vulnerable people. Coastal and inland fisheries are also vulnerable to man-made change, such as loss of important habitat and spawning in wetland areas or changes in water movements caused by water resources developments. The marine capture fishery can also significantly impact coastal fishery resources, and available evidence indicates that current fishing operations, including destructive fishing practices, are causing significant adverse impacts on aquatic biodiversity.

Aquaculture

68. Aquaculture development in Vietnam also has significant environmental implications. Aquaculture can cause environmental impacts, both positive and negative and is also sensitive to changes in the environment. Natural and man-made environmental threats include typhoons and floods, pesticide use in agricultural areas and decreasing water quality (Phuong 2002). Typhoons and floods can severely damage infrastructure, such as ponds and cages as for example in the 2000 Mekong delta floods (van Anroy, 2000). Examples of positive environmental impacts from aquaculture include the traditional agriculture, aquaculture, and animal husbandry integrated farms that recycle waste and store water for multiple uses and integration of fishponds into water resource schemes and irrigation networks. The sewage fed fish ponds and agriculture fields in Tranh Tri district on the outskirts of Hanoi until recently provided a cost-effective and environmentally sound way of producing food and treating domestic effluent.

69. Environmental concerns relating to aquaculture development in Vietnam include:

- localized water pollution from concentrations of freshwater and marine cage farms and lack of consideration of carrying capacity;
- the need for more care to be taken with introduction of new exotic species, due to risks of disease and impacts on aquatic biodiversity;
- the significant loss of mangroves and wetlands from conversion of coastal areas and estuaries to shrimp farming;
- aquatic animal disease outbreaks, water pollution and salinization caused by poorly planned and managed shrimp farming in sandy and agricultural areas; and
- the dramatic recent rise in the use of trash fish in marine and freshwater aquaculture.

Such environmental interactions need careful consideration in the promotion of aquaculture in Vietnam, and should be addressed through better environmental planning and management practices and capacity. More details are provided in Appendix I.

Development/Sustainable Management Opportunities and Constraints

70. Based on the fieldwork of the study team and available data, the main conclusions that are drawn are listed below:

Marine Sector

- Almost all inshore areas are over-exploited, making life hard for coastal communities relying on fishing. The fisheries master plan envisages a reduction of about 30,000 vessels with engines under 45hp compared to the present fleet of about 64,000 by the year 2010.
- Small fisher families experience difficulties in finding alternative livelihoods. However, this problem has not yet received much attention from local authorities.

- Offshore waters in the north (Tonkin Gulf) are over-exploited.
- Increasing aquaculture and seasonal closure of Chinese waters may boost the exploitation of fish (including trash fish) in Vietnam's waters.
- Central and southern offshore waters do not appear to be over-exploited – some resources under-exploited, e.g., deep water (>100 meters) demersal and meso-pelagics. Southern provinces continue to support increasing offshore effort except Kien Giang that considers offshore areas (particularly in the Gulf of Thailand) to be over-exploited. Ba Ria-Vung Tau also has expressed concern over offshore resources.
- Many of the larger vessels fish inshore waters and overall, numbers of larger vessels need to be substantially reduced, with the master plan indicating that the fleet of vessels of over 75hp should not exceed about 6,000, compared to 10,500 at present.
- Many of the 1,300 subsidized credit scheme boats have failed, particularly those bought by State Enterprises. Private sector offshore boats were generally found to be profitable in the survey conducted as part of the FIIP PCR and other MOFI surveys.
- Effective resource monitoring and management has not been put in place.
- All DOFis interviewed highlighted a need for improved technology for offshore fishing.
- Crew skills are often low, especially on offshore vessels. Few captains have received any formal training.
- There is potential for rapid growth in fishing effort as boats begin to invest in fish finders, and vessels become more powerful with larger gear. However, growth may be tempered by limited access to formal credit.
- Most trawlers in the south use small mesh cod-ends of 2-3 cm stretched mesh. Not all trawlers use bobbins, leading to increased damage to the bottom environment.
- Dynamite fishing is still widespread in some areas, but in others (e.g., where the resource has been severely depleted) it has ended. Electric fishing is increasing, destructive and difficult to prevent.
- Push netting is highly destructive and continues to be used in some provinces although it is banned.
- The legal framework for marine resources protection appears to be comprehensive. However it is not yet fully effective due to the lack of enforcement capacity.
- Post-harvest management is not well developed. All vessels currently use ice for storage, but for long trips (e.g., >1 month) the quality of early-caught product deteriorates. This can be overcome by transshipping to support vessels at sea or offshore ports such as Con Dao.
- Limited ice storage capacity on some vessels means that there is insufficient ice for long trips and particularly for low-value species. Salt is often used for the preservation of low value fish.

Fishing Ports and Shelters

- Port numbers and aggregate wharf length have increased rapidly. However, port planning has been inadequate, both during FIIP and subsequently through provincial port development programs.
- Most ports are poorly designed. Key issues at Tran De include failure to allow for annual flooding, leading to submergence of the wharf and damage to boats and structure. While the ports were mainly designed for offshore vessels, all FIIP ports had facilities intended for use by small vessels. However, the design has proved to be inconvenient in the situation of the ports, and few small vessels use them.
- Coastal erosion is severely affecting coastal/fishing communities in some coastal provinces including Bac Lieu, Quang Nam, Quang Ngai and TT Hue.
- Some estuaries are silting severely – affecting the ability of vessels to enter with implications for efficiency and safety and reducing their potential to provide typhoon shelter.
- A number of fishing ports have been developed by local authorities. Port management and cleanliness can be poor.

Port maintenance will be a problem as fees collected by most ports do not cover operation costs and users are not yet involved in port management.

- There is a need for facilities to improve waste management (oil disposal, garbage, processing waste) at several of the ports visited.

Information and Planning

- Statistics are uniformly weak – provinces have no ready access to data on vessels, gear or landings. Few data are available on landings of species or species groups, reducing the value of published data for fisheries management.
- Information from different sources (e.g., MOFI, GSO and ALMRV) is not always consistent. The plan to integrate MOFI and GSO statistics is a positive step.
- Information from the small-scale inshore and inland fishery and its importance in poor people's livelihoods is particularly weak.
- Lack of knowledge in all DOFis of marine resources, stock status and fishing grounds, good practice and lessons learned.
- Some provinces have limited fisheries and aquaculture planning capacity.
- Aquaculture plans tend to focus on general land use planning, and less on capacity and institutional support, resulting in weakness in implementation and environmental problems.

ICZM and Co-management

- Aquaculture plans tend to focus on general land use planning, and less on capacity and institutional support, resulting in weakness in implementation and environmental problems. All provinces with which integrated coastal zone management (ICZM) and co-

management were discussed were supportive and keen to become involved, though opinion in Soc Trang was mixed.

- Co-management of the offshore fishery was also discussed, e.g., with respect to license, gear, and geographic or seasonal limits. In principle the few fishers with whom it was discussed were reasonably supportive, but it is recognized that implementation in Vietnam would be difficult, as in most countries, due to low levels of awareness of needs for conservation.
- MPAs were seen as valuable.

Freshwater Aquaculture

- Freshwater aquaculture is environmentally sound with diverse culture systems that have expanded widely throughout Vietnam without major problems.
- Integrated polyculture systems in ponds or rice fields are widely practiced, dominated by carps.
- Freshwater aquaculture has contributed to diversification of agriculture farms.
- Semi-intensive and intensive monoculture culture of catfish and tilapia has started in both Mekong and Red river deltas, and there are trends towards intensification and monoculture.
- Fish seed production is well established. Fish seed quality, management of genetic diversity, and species diversification need to be supported.
- Fish seed and nursing networks needs to be extended to support aquaculture in remote areas, including upland areas with poorer groups.
- Feed is not a constraint for freshwater carp species in polyculture and integrated systems. With trends towards intensive freshwater aquaculture, low cost plant-based feeds will need to be developed.

Brackish Water Aquaculture

- Shrimp farming is dominant in brackish water aquaculture.
- Production of shrimp is increasing steadily mainly through expansion of farming area. The main issue is sustainability. Improvements in efficiency, disease control, environmental planning and management and quality control/food safety assurance will be essential.
- Environmental problems have arisen from poor planning and operational management of shrimp farming. Improvements in environmental management are urgently needed.
- Shrimp seed quality and infection with viral pathogens are critical issues. Further improvements in seed quality control are needed.
- Poor farmers are most vulnerable to poor quality seed, and disease risks.
- Poor water management infrastructure in many shrimp farming areas, compounded by poor design and limited investment and lack of coordination between agencies with responsibilities for irrigation management create additional risks to farmers.
- Provinces consulted during the mission requested support in improving environmental planning and management of shrimp farming.

- Shrimp processors and exporters are increasingly concerned with trace-ability, and sourcing of uncontaminated product. Food safety assurance schemes and cooperation between farmers and processing plants are required.
- Species diversification in brackish water areas is an urgent priority. Lower risk farming options for poorer households include mollusk (clam, blood cockle, blue mussel), crabs and fish.

Marine Aquaculture

- There is increasing investment interest in the marine farming sector, from government and the private sector, including international investors.
- Marine fish culture is prospering in Quang Ninh and Nha Trang (Khanh Hoa). Environmental problems are being experienced once carrying capacity of the water body is exceeded. Feeding of trash fish is particularly damaging to the environment due to fall-through of substantial proportions of feed.
- Mollusk farming in sandy long-beach areas in the north-central coastal region appears to offer substantial low risk development opportunities.
- Marine fish farming is heavily dependant on the wild fishery due to collection of seed from the wild and use of “trash fish” feed. These practices are unsustainable and should be replaced by investments in hatchery production, and better feeds and feeding practices.
- The MOFI target of 200,000 tons of marine fish by 2010 would in theory require at least 2 million tons of trash fish based on current practices, which is unattainable without investments in more efficient feeds and feeding practices.
- Recent experiences with low cost cage and Norwegian-style cages for marine fish species demonstrate the possibility of use of various cage types for grow-out of a number finfish species.
- Special engineering knowledge and practice for marine systems have not been adequately accumulated to ensure safety and long cage life.

Environment and Resources

- Natural and society-affected environmental change impact aquaculture. Pesticides and water quality caused by domestic, agriculture, and industrial pollution are a particular concern for future aquaculture and fishery development.
- There are significant environmental problems to be resolved in the coastal aquaculture sector, particularly loss of mangroves and water quality deterioration caused by shrimp farming.
- Strengthening of environmental management in planning and operational management of brackish water and marine aquaculture is essential.
- EIA is usually not been carried out as part of planning process, although the basic EIA legal framework is sound.
- High value marine species such as grouper, lobster and shrimp are contributing to use of marine resources, including low value fish, fishmeal and fish oils.

- Control of diseases in aquaculture is a priority in all Provinces visited by the mission.
- Provincial aquaculture plans are difficult to implement. Provinces visited by the mission request support to improve aquaculture-planning practices and integrated coastal zone management.

Poverty and Social Development

- The livelihoods of many people in inland and coastal areas are dependant on aquatic resources.
- Incomes of fishing households in the northern central provinces are low. The new GoV program identifies 157 coastal communes where 30% of households have income per person lower than Đ100,000/month (less than US\$0.07/person/day).
- Provincial authorities consulted during the mission support aquaculture for poverty reduction in coastal areas. They recognize the need to improve capacity to implementation poverty reduction programs.
- Technologies for small-scale aquaculture that work best for poor rural households are available. A major impediment to poor people's entry into the aquaculture sector is in the ability of service providers to effectively target support.
- Freshwater mountain areas appear to have significant potential for expanding aquaculture for poverty reduction.
- Aquaculture offers scope for further diversification of income on agriculture farms.

Fisheries/Aquaculture Education

- Fisheries University has made much progress in last decade. However, it needs further upgrading. Other Universities offer aquaculture training in the north, central and southern regions.
- Education/training for marine fisheries operation and management is limited. However, Nha Trang Fisheries University finds difficulty in filling available places.
- Skills levels in the aquaculture industry are improving but remain quite low among farmers and lower administrative levels of government.
- Upgrading of skills through lower level vocational training requires more attention and should be further supported.
- Sustainable development of the aquaculture sector and poverty targeting will require substantial upgrading in service support.

Policies and Legal Framework

Fisheries Law, Policies and Decrees

71. In Vietnam, government policies are defined in laws, decrees, ordinances, circulars and regulations, the last often at provincial level. Provinces are the lowest level at which regulations can be drafted, consistent with national legislation. Since 1996, the Government has emphasized development of the market economy under the *Doi Moi* (renovation) policy.

Fisheries Law

72. A new Fisheries Law was drafted by MOFI with help from Norwegian Development Agency (NORAD) and FAO, passed by the National Assembly in November 2003, and went into effect on July 1, 2004. It appears to be well drafted and empowers resource managers, particularly at the provincial level, to effectively manage their resources. The Law's articles are summarized in Appendix D. It provides a much-improved basis for management of the capture fisheries and aquaculture sectors, including the potential for the involvement of stakeholders. It is closely linked to the Fisheries Master Plan and could do more to address fully issues relating to market-driven development planning. As experience is gained with the implementation of the law, it may be necessary to amend it, pass appropriate decrees that define the rights of government, fishers, aquaculturists and other stakeholders. In principle, government intervention in the sector can best focus on setting the framework for development, regulation (e.g., effort limitation), monitoring, surveillance and enforcement, extension and information dissemination. Involvement in investment decisions should be limited to ensuring environmental sustainability, social aspects such as employment promotion or diversification and adherence to the prevailing laws and policies of the government. At the same time, a consultative process with all key stakeholders should be employed through an enabling framework and required support for it, when formulating management and resource conservation plans.

Master Plan

73. The development policies of the government are summarized in the fisheries sector Master Plan (MOFI 2004b). MOFI remains responsible for sector planning, though much detailed planning is now undertaken at provincial and lower administrative levels in line with government decentralization policies. Basic planning takes place at the commune level, with plans aggregated at district, province and ultimately national level. Plans include annual budgets and medium term (5-year) and long-term (10-year) development goals. A new Master Plan was completed in 2003 and approved by MOFI in 2004. It is currently under review by the Government and when approved will provide useful guidance in reference to the Fisheries Law and fisheries and aquaculture development.

License Limitation and Boat Construction Support

74. State legislation was introduced in 1997 to limit the construction of vessels of less than 20hp. After 1998, construction of new vessels was banned. This was intended to force inshore fishers to build larger vessels and fish offshore. However, in practice, they have often continued to fish inshore with the larger vessels, or have failed to register new small vessels. This policy may require review and redefinition, perhaps including a mandatory license surrender policy.

75. Similarly the number of vessels over 90 hp has increased, as regulated in the decision 393/TTg of 1997 which supported the construction of vessels and their sale to fishers at subsidized interest rates. This program has had some positive impacts, e.g., through pioneering the offshore fishery in some ports such as Phan Thiet. However, the subsidized vessels have experienced a high failure rate, and only about 10% of the 1300 vessels funded under the program are meeting their scheduled repayment despite a reduction of the interest rate from 7% to 5.4% in 2003.⁴

Aquaculture

⁴ Various reasons were put forward by provinces for the program's lack of success, including: (i) lack of offshore technology; (ii) lack of experience by skippers and crew; (iii) vessels of predefined and inappropriate specification, costing 20 - 50% more than equivalent private vessels; (iv) lack of follow-up and support by financial and fisheries institutions; (v) a belief that the loans did not need to be repaid, and withholding of payments by some of the more successful boats. State enterprise boats have been particularly unsuccessful, and in Soc Trang for example, all 12 of the state enterprise boats have been repossessed and allocated to other fishers.

76. Aquaculture has received increasingly strong support in Government policy over the past 10 years, as the sector has become recognized as playing an important role in Vietnam's economic development and poverty alleviation. The policy environment for aquaculture is complex, influenced by policies implemented within MOFI, and other Ministries. There are reported to be several hundred decrees, resolutions and circulars affecting the fishery sector. Other decrees and policies relating to Vietnam's fisheries sector are listed in Appendix D.

International

77. The member countries of the Food and Agriculture Organization of the United Nations (FAO), including Vietnam, adopted the Code of Conduct for Responsible Fisheries (CCRF) in 1995. The CCRF defines the principles of sustainable fisheries management; many countries including Vietnam have adopted the code. FAO experience indicates that effectively managing fisheries is impossible without removal of the key causes behind the excessive investment levels in fleets and infrastructure of the past. Of these, overt and hidden subsidies have played a major role.

78. Chapter 9 of the CCRF⁵ concerns aquaculture, providing a useful framework for analysis of the status of aquaculture policy and development from the perspective of internationally recognized standard practice. A workshop hosted by MOFI in cooperation with Food and Agriculture Organization (FAO) and the Network of Aquaculture Centers for Asia Pacific (NACA) during 2003 reviewed the present status of implementation of the CCRF in coastal aquaculture in Vietnam. While considerable progress has been made, with the newly formulated Fisheries Law providing a comprehensive legal basis for future aquaculture development, the workshop pointed to a number of areas where capacity building and improvements could be made including:

- Strengthening of aquaculture planning processes and practices, at provincial, district and commune levels, with more attention on environmental management and livelihood issues.
- Strengthening of environmental impact assessment procedures.
- Integration of aquaculture into coastal zone management.
- Better management of genetic diversity in aquaculture, with the new policy on seed production (Decision 112) as a good legal foundation for defining of practical programs.
- Regulations and procedures for risk assessment in importing new (exotic) species, covering ecological and aquatic animal disease risks, effective disease surveillance and quarantine programs.
- Strengthening of local farmer organizations and community-based management of aquaculture, and participation of local farmers and fishers in planning and management of coastal aquaculture.
- Creating more cooperation among different stakeholders, including local farmer organizations and investors, service suppliers, extension workers, seed producers and research institutes.
- Regulations and procedures for assuring quality of major aquaculture inputs, including feed, seed and chemicals and waste management.

⁵ The summary here is largely derived from the Van Anrooy, R. Tran Van Nhung; Phillips, M. (eds.) Report of the National Workshop on the Code of Conduct for Responsible Fisheries and its practical application to coastal aquaculture development in Vietnam, which was held in Hue, Vietnam on 3-4 October 2003. *FAO/FishCode Review*. No. 8. Rome, FAO. 2003

- Increasing awareness among government administrations and farmers on international food safety regulations and understanding of trade barriers and the implications of irresponsible chemical use.

Co-management

79. In May 1995 MOFI held a workshop on Co-management of Living Coastal Resources in ASEAN: Theory, Practice and Implications for Vietnam. At the conclusion of the workshop the Vice-minister for Fisheries, enthusiastically endorsed the principles of co-management and stated that MOFI would work toward the; 'selection of, formal recognition of, and funding for pilot test sites for the establishment of co-management activities in coastal fisheries including marine protected areas and aquaculture'. (ADB 1996)

80. Since then, co-management has made substantial progress. In particular, the rights to manage inland waters have been passed to communes. In coastal areas, pilot marine co-management schemes have commenced in at least four provinces (Quang Ninh, Khanh Hoa, Binh Thuan and Yen Bai). Co-management principles are being applied under the World Bank/GEF/DANIDA financed Hon Mun MPA project. In brackish water aquaculture, awareness of co-management principles is more widespread, but there is a need to provide guidance to DOFis and farmers in implementation, for example, in environmentally sound water and drainage management.

81. Co-management is supported quite strongly under the new fisheries law. Co-management is also provided with strong support under the government's grass-roots democratization policy, which delegates substantial power to the communes in the planning, development and management of their resources.⁶

Coastal Zone Planning and Management

82. Traditionally, coastal zone planning in Vietnam has been largely *ad hoc*. Different agencies with interests in the zone would propose plans to the provincial peoples committees and Departments of Planning and Investment (DPIs), which then approve plans in relation to available budget, in many cases ignoring boundary issues, negative environmental impacts or the interests of other stakeholders. The PPCs and DPIs can exercise some control over the planning process, but in general provincial and local level planning has not been fully effective. Other problems occur due to the autonomy of provinces, which has resulted in development (e.g., of fishing ports) in provinces without sufficient account being taken of other developments in the region.

83. In an attempt to overcome these and other problems, the concept of integrated coastal zone planning and management has developed rapidly in some countries in the Asia-Pacific Region. Vietnam has itself embarked on an ICZM program, initially in Da Nang (supported by the International Maritime Organization) and in Nam Dinh, TT Hue and Ba Ria Vung Tau, supported by the Dutch government under the Vietnam Netherlands Integrated Coastal Zone Management project (VNICZM) that is now commencing its second phase. ADB is expected to commence design of a project covering at least 5 central region provinces between Quang Binh and Quang Nam in the near future. NOAA is supporting ICZM in Quang Ninh. Over the next 10 years, it is expected that most of Vietnam's 29 coastal provinces will develop ICZM capacity, supported by the proposed national ICZM center and the ICZM Division of MONRE. ICZM will be integral to the planning, development and management of coastal and near-shore fisheries and aquaculture activities.

⁶ The 1998 Grassroots Democracy Decree established the legal framework for the participation of citizens in local decision-making processes at the commune level and their right to monitor local government expenditure. Although the capacity of citizens to participate actively remains constrained, especially by their lack of awareness of their rights, the decree is enhancing the transparency of policy making and planning and increasing the accountability of local government officials.

Possible New Policy Directions

Master Planning and Fisheries Legislation

84. The fisheries master plan and the Fisheries Law are strong new additions to fisheries sector planning, development and management. They represent a substantial step forward, particularly through promoting the closer involvement of stakeholders in the decisions that affect them. However, it is evident that the approach to development continues to apply many of the principles of central planning. The master plan is referred to in 11 of the 62 articles of the fisheries law, and most development activities are subject to the master plan. However, master plans do have some flexibility in that they are revised every three years and directly involve provinces in the decision making process.

85. MOFI will need to continue to exercise and coordinate control over the fishery and to ensure that exploitation is rational and sustainable. This means that it could benefit from consultation with industry and research organizations toward the development of fisheries management tools such as license, catch, seasonal and gear restrictions. Management plans for fisheries need to be developed on a co-management basis, e.g., with shared responsibilities between the government and resource users. It may also need to set the guidelines for fish processing (e.g., by reference to accepted international standards), and to closely monitor plants to assist them to maintain export certification and hygiene standards for local and export products. However, beyond these and a few other aspects, it is desirable that fisheries development is left to the private sector. Under the market economy, it should not be necessary for the government to prescribe the detailed development path to be adopted.

VINAFIS

86. VINAFIS is the mass organization representing fishers and aquaculturists (see para 123.). While it has the potential to be a powerful organization, at present, it is still finding its feet and has yet to become an effective partner to the government in terms of policy development and planning. In the future, it is considered that the organization should become fully private sector. Only in this way can the fishing and aquaculture sectors develop an independent and constructive voice. While it is appreciated that VINAFIS is a combination of the original Fisheries and Aquaculture Associations, it is considered that the two sectors are different and have little in common apart from the products they produce. It is, therefore, suggested that VINAFIS should develop strong marine fisheries and aquaculture chapters, so that the interests of each sector can be represented. Effective involvement of local aquaculture farmer associations in VINAFIS will also be a key to building a democratic organization, and strengthening the representation and impact of VINAFIS.

State Ownership

87. According to the master plan, MOFI has reduced its role in the management of state enterprises to one of general oversight. However, in practice, in addition to the 51 enterprises owned by the three general corporations, there are numerous provincial level enterprises. While data on their performance are not available, many are experiencing substantial problems and for example, are engaging in activities far removed from their original charter, such as the export of labor. Fisheries and its related activities such as processing and marketing are not suitable for state management. They have proved to be ineffective in all countries, and Vietnam is no exception. It is consequently desirable that all state enterprises, both central and provincial, are privatized over the next few years and that the state ceases all involvement in fisheries and processing company ownership and management. The private sector is now well established and able to meet the sectors' development needs.

Co-management

88. In the short run, to put co-management in place requires a critical analysis and redefining roles of Government and civil institutions. Creating necessary conditions for the establishment of civil

institutions, strengthening their capacities and ensuring access to necessary information, particularly those concerning resources, are extremely important. In the long run, it is necessary to further develop the legal framework for community-based management of fisheries resources. Although the new Fisheries and Land Laws allow for allocating of water-space for aquaculture and granting “land use certificates” for households and enterprises, this is still to be fully implemented. The rights of communities over the fisheries resources they use for their livelihood also need to be clarified. Decisions on implementation of these aspects will be required in the development of regulations to implement the new Fisheries Law. A participatory process involving communities will be important in ensuring that such concerns among local communities are properly considered in the development of enabling regulations for the new Fisheries Law.

SPS Regulations

89. In the short-term, synchronizing Vietnamese sanitary and phyto-sanitary (SPS) regulations with relevant international standards is important for Vietnam’s accession to WTO as that pertains to the fisheries and aquaculture sectors. In this connection, it is also necessary to assess the degree to which, if any, Government subsidies are provided to the sector. It is necessary to continue to develop the capacity to implement the requirements that influence Vietnam’s competitiveness in both international and domestic markets. Given the importance of the small-scale aquaculture sector to the country’s production base, special technical assistance may be necessary to assist smallholder aquaculture farmers to address increasingly stringent SPS requirements.

Poverty Reduction Strategies

90. Integration of poverty reduction into sectoral strategies and the sector’s five-year socio-economic development plan has many advantages. Results-based planning can further be developed to supplement the existing focus on inputs and outputs to assist in prioritizing programs and allocating resources as promoted by the Government. Effective application by MOFI would create a clear integrated framework guiding both domestic and external efforts in the sector. In particular, MOFI’s pro-active participation in reshaping poverty reduction programs would improve targeted and coordinated support to both inland and poor coastal communes.

91. Policy development needs support and close cooperation between MOFI and other government agencies. If that can be achieved by the end of April 2005, subject to Government/MOFI interest, it is proposed to include the above policy actions for discussion by the Government and interested donors under the preparation of the forthcoming Poverty Reduction Support Credit IV to start in September and is expected to be accomplished by no later than December 2005.

National and Local Institutions

92. Vietnam’s fisheries sector over the past decade has been marked by rapid change in institutional structure and policy from a centrally planned economy to one with a more market-driven orientation. The changes are far from complete, and there remain questions about their sustainability and equitability.

Private Sector and SFEs

93. The non-state sector, including the private, cooperative and joint-venture sectors, has been the most dynamic, in terms of job creation, investment and turnover growth. Though those sectors perform quite well in terms of investment and profitability, the number of non-state fishery enterprises appears to have stabilized after 2001 (Table 4). The private sector also plays an increasing role in provision of inputs, particularly fishing gear, feed and seed supply, boat repair and aquaculture extension services.

94. In contrast, the role of the state fishery enterprises (SFEs) is weak and has declined in capture fishing and aquaculture as production has moved into private hands. However, they continue to

dominate in processing, export-import, and the provision of other fishery services, e.g., boat building and repair. In addition to their business functions, some SFEs, particularly those involved in offshore fishing and fishery services, are assigned to conduct public service functions such as sea guards and social service deliverers to remote islands.

Table 4. State and non-state fisheries enterprises

| | Unit | 2000 | 2001 | 2002 |
|--------------------------------------|---------|-------|-------|-------|
| Number of enterprises | Number | 2453 | 2563 | 2407 |
| - SFEs | | 49 | 49 | 41 |
| - non-SFEs | | 2392 | 2496 | 2345 |
| Number of employees | persons | 37253 | 40376 | 40746 |
| - SFEs | | 4310 | 5926 | 4357 |
| - non-SFEs | | 31915 | 33008 | 34519 |
| Fixed assets & long-term investments | Đ bill | 1595 | 1765 | 2051 |
| - SFEs | | 216 | 266 | 227 |
| - non-SFEs | | 1340 | 1403 | 1722 |
| Net turnover | Đ bill | 2237 | 2292 | 2230 |
| - SFEs | | 469 | 448 | 345 |
| - non-SFEs | | 1745 | 1788 | 1830 |
| Profit before tax | Đ bill | 146 | 131 | 188 |
| - SFEs | | 6 | -4 | 28 |
| - non-SFEs | | 167 | 170 | 174 |

Source: GSO (2004) Results of Enterprise Surveys in 2001-03

95. The number of state-owned businesses in the sector has decreased steadily. Among 41 SFEs that existed in 2002, three are large state-owned general corporations, managed centrally by MOFI; and the rest are much smaller enterprises managed by PPCs. Despite the tendency of increasing labor and capital and government subsidies through access to cheap credit (via both the offshore fishing program and subsidized loans from the Government's Development Assistance Fund (DAF), SFEs, including past flagships (e.g., SEAPRODEX and Halong Fisco), are characterized to have low efficiency. While the SFEs had received the major portion of scarce public resources and thus reduced the capacity for investment in the private sector in the past, their long-term financial sustainability and competitiveness with the

growing private sector are questionable. Equitization – the process of reforming a SOE by separating the public function from the business one, selling an equity stake to its employees and outsiders and putting it under the registration of the Enterprise Law instead of the State-owned Enterprise Law – is being implemented by the Government as a measure to address the problem. However, there has been slow progress and most equitized enterprises are small. MOFI plans to reorganize its three corporations, though with the state retaining a major stake.

96. Institutional structures to support the sector in the civil sphere are underdeveloped. After the dismantling of the “old style” cooperatives in early 1990s, the reconstituted producer-controlled cooperatives have mainly been performing well. The number of producer-controlled cooperatives has consequently increased and by 2001, there were 525 of these cooperatives with about 20,000 members, including 463 capture fishing cooperatives with 16,000 members and 33 aquaculture cooperatives with 3,200 members. However, the contribution of cooperatives to the sector remains limited and many issues need to be addressed to make them attractive to small producers. Lack of effective cooperation among small producers is a serious institutional constraint in the sector, suggesting that further development of VINAFIS will be desirable to improve coordination and sharing of knowledge.

National and Provincial Institutions

Role of the Government and Public Spending

97. The government has been an integral and the most influential part of the sector development for years, controlling the (i) development of fisheries-related institutions through its policy and regulations, (ii) provision of various public services (e.g., master planning, infrastructure development and targeted assistance to the poor) and (iii) direct interventions (both by administrative measures and through SFEs). The sector's specific institutional structure includes MOFI – the central focal point for state management (with its subordinate public utility institutions and SFEs), provincial departments of fisheries (in 25 mainly coastal provinces, out of 64 provinces, with provincial subordinate SFEs), and fishery sections in some districts. There is no representation at the commune level. In most inland provinces and districts, state management of fisheries is integrated with that of agriculture (DARDs). The structure also includes the involvement of other institutions under the Office of Government,

Ministry of Planning and Investment, Ministry of Finance, MARD, MONRE, state-owned commercial banks (e.g., Vietnam Bank for Agriculture and Rural Development (VBARD), Bank for Investment and Development of Vietnam, Vietnam Bank for Social Policy and PPCs at the same level, making effective coordination and management complex and difficult.

98. The most remarkable change to be noted is the tendency of steady decentralization from the center to the provincial level in terms of policy implementation, planning and budgeting and budget execution. The share of the spending conducted at the central level fell from 41% in 1997 to 22% in 2002, while local levels grew from 59% to 78%. With the new Budget Law from 2004, local people's councils are fully responsible for allocation of public resources at their levels, except those for education and scientific research. The Government's recent decentralization decree has further expanded local autonomy in resource allocation and budget execution. This, however, poses a challenge to MOFi to ensure consistent implementation of sectoral policy and programs at the local level, particularly when local interest does not necessarily coincide with the national one (e.g., protection of marine resources, sanitation and quality control or, in some instances, poverty reduction strategies).

99. Limited public infrastructure means that public resources continue to play an important role in the sector. The share of spending on fisheries in the national budget and growth in spending were consistently lower than the contribution of fisheries to the country's GDP, exports and their growth during 1997-2002. This is partly because of the increasing role of the non-state sector. Justification for a substantial increase in public spending to the sector in future may include the need for restructuring existing rice-culture-oriented irrigation systems to include aquaculture and other crops; development of market infrastructure; and improvement, maintenance, and protection of fisheries resources. However, any investment targeted for poverty reduction needs careful design to assure high effectiveness under the Government's Hunger Eradication and Poverty Reduction Program and the Program to Assist the Poorest Communes.

Ministry of Fisheries (MOFi)

100. MOFi is the main Government body responsible for protecting and developing fishery resources. MOFi is responsible for defining (i) total allowable catch and fishing capacity, (ii) protection measures relating to the marine environment and living resources; and (iii) zoning, monitoring and research. MOFi also issues and withdraws fishing permits. It has 11 Departments, that assist the Minister in exercising state management functions, and a system of institutes, training institutions, and state-owned enterprises specializing in fishing and aquaculture. Total staffing is now 222 (excluding drivers and watchmen, and its affiliated institutes) with a current annual operating budget of almost Đ9 billion. These levels are a significant increase over 2002/03 levels, though MOFi remains one of the smaller ministries.

National Fisheries Quality Assurance and Veterinary Directorate

101. National Fisheries Quality Assurance and Veterinary Directorate (NAFIQAVED) has a head office and six branches located in key fisheries areas of the country. It is the national competent authority for fisheries food safety assurance and quality control. In August 2003, the responsibilities of the centers were expanded to include veterinary matters, including fish and shrimp disease control.

Provincial Departments of Fisheries

102. To assist provincial authorities to manage their fisheries and aquaculture sectors, most coastal provinces have set up departments of fisheries (DOFis). However, in some inland provinces there is no fisheries department and the fisheries sector is the responsibility of the Department of Agriculture and Rural Development (DARD). DOFis are line agencies assisting the provincial people's committees in the implementation of state management over fisheries at the provincial level. At the same time, they report to and are guided technically by MOFi. DOFis typically have a staff of 15 to

25 permanent officers, depending on the role and value of fisheries and aquaculture of the province. DOFis usually have a number of divisions: administrative, technical, financial and planning. DOFis also manage fisheries extension centers and the sub-departments of fish resources protection. Some DOFis operate fisheries vocational schools. Extension centers are responsible for implementation of extension programs in both aquaculture and fisheries. The Provincial Departments of Fishery Resources Protection (PDFRP) is responsible for registration of large and small fishing vessels and for controlling overall fishing activities in the sea and other water bodies, following the government regulations; provides fishing licenses; and grants permission to fish in particular areas. In many provinces there are project management boards that are responsible for managing fisheries and aquaculture development projects.

103. The main problem faced by the DOFis is lack of trained and limited numbers of staff, with no full time representation below the district level. This combined with shortage of transport and equipment makes it difficult for them to fulfill their mandate. The fisheries and aquaculture sector has been developing rapidly, becoming the one of the main socio-economic, rural growth sectors in coastal provinces. The lack of professional management at the district and commune level means that data collection and monitoring activities are limited, resulting in poor data and reduced ability to assess development potential and performance.

104. Extension in fisheries and aquaculture now is a diversified activity. A number of agencies contribute, including the fisheries extension centers, three fisheries colleges, the national/regional research institutes (see below), the mass organizations (farmers' association, the newly formed fisheries association, the women's union) and shrimp feed and processing firms. DOFI is responsible for encouraging and creating good extension activities. While some Government bodies and shrimp feed and processing companies provide valuable technical service, it is important that the advice provided is tailored to the long-term viability particularly of aquaculture.

Local institutions

105. Key local institutions include:

Communist party at province, district and commune level and the people's councils at each level; Province, district and commune people's committees; and

- Local level VINAFIS branches, women's unions, and farmers' and youth associations.

Research and Education

Institutions

106. Fisheries sector research programs are conducted through several MOFI institutions, including

1. Institute of Fisheries Economics and Planning (Hanoi)
2. Research Institute for Marine Fisheries (Hai Phong)
3. Research Institute for Aquaculture Number 1 (Bac Ninh)
4. Research Institute for Aquaculture Number 2 (HCMC)
5. Centre for Aquaculture Research Number 3 (Nha Trang, Khanh Hoa)
6. Fisheries Informatics Center (FICEN)

The institutes provide support to MOFI in fisheries and aquaculture development, in such areas as policy-making, planning, aquaculture technology development and others. Research Institutions under other ministries include: (i) Institute of Oceanography (Nha Trang with a branch in Hai Phong, under the Ministry of Science and Technology (MOST)); (ii) Fisheries University (Ministry of Education and Training - MOET); and (iii) several other educational institutes (see below) which undertake aquaculture research and education.

Current Research and Monitoring

107. Aquaculture research is conducted through the Research Institutes and Universities. In MOFI, research is coordinated by the Department of Science and Technology. Budgets for research come from MOFI, the Ministry of Science and Technology and the Ministry of Education. Some universities and research centers also receive research funds from provincial governments for investigation of provincial problems. For example, Can Tho University has received funding support from the Department of Science and Technology of Long An and An Giang provinces for catfish research.

108. International research funds have also supported aquaculture and fisheries research, bringing useful collaboration and scientific skills to involved institutions. Larger private sector firms (e.g., feed producers and chemical companies) are also starting to sponsor research, albeit mainly product testing and development. The amount of government funds for research has significantly increased over the past three years as the value of aquaculture and fisheries exports has increased.

109. There is a wide range of ongoing aquaculture research. Much aquaculture research has traditionally focused on technical issues, and less on formulating and implementing farmer-driven research agendas. It is only more recently that more adaptive, farmer-needs-driven aquaculture has been piloted, such as through RIA-1, the MRC READ, and AIMS projects in the Mekong Delta (Phillips 2002). The impact of research on aquaculture development can be substantially improved through addressing the following issues:

- stimulating research quality through more competition for funding, for example through more open bidding for research funds;
- improving monitoring and evaluation of research;
- developing more collaborative long-term research programs, bringing together institutes with relevant skills to address constraints;
- providing greater access of universities to MOFI research funds;
- developing more farmer/demand led research by closer consultation and collaboration with farmers in identification of research requirements, including closer cooperation between researchers and ongoing extension/development projects;
- paying more attention to dissemination of research findings to end users;
- creating incentives for researchers based on development outcomes from research; improving the poverty-orientation of aquaculture research; and
- ensuring the right balance in research between technical aspects, and environmental and social issues, and between aquaculture and inland and coastal fisheries.

110. Capture fisheries research is mainly conducted through RIMF and the Fisheries University. Overall research efforts are limited, compared to the size of the sector and value of production. In future, increased funding and activity will be essential if the scientific basis for the fishery is to be understood, and appropriate management measures are to be defined.

Environmental and Disease Monitoring

111. Concern over the state of aquatic resources in Vietnam is leading to further investment by government in environmental monitoring programs. MONRE has recently finalized national standards for air and water quality and is working toward strengthening the environmental monitoring network. Eighteen general environmental supervision units have been established, with nearly 150 monitoring stations, focusing on water and atmospheric quality. Vietnam also needs to establish effective surveillance and reporting systems for aquatic animal diseases if the negative economic and trade impacts from future disease outbreaks are to be minimized, following the international standards established by Office International des Epizooties (OIE).

112. The Ministry of Fisheries has recently approved a long-term project to develop an environmental and disease-monitoring network, covering the three major regions of Vietnam. The Research Institutes for Aquaculture in the northern, central and southern region have been given responsibility for design and operation of the networks, but there has been limited progress to date. Government funding is provided, and DANIDA is also supporting the development of the networks through its Fisheries Sector Program Support (SPS).

113. Environmental monitoring programs are being developed by several agencies. However, there is some duplication and a lack of a coordinated approach. Training and better organization and management of the system is required. Regulations are also needed on procedures and responsibilities for operation of the system particularly at provincial levels. The aquatic animal disease surveillance and reporting system will also require substantial technical support for capacity building and institutional organization.

Links to Other Regional and International Organizations

114. Vietnam is a member of several regional intergovernmental organizations involved in fisheries and aquaculture development, including SEAFDEC, NACA, and the Mekong River Commission (MRC). This collaboration provides good opportunities for sharing experience among countries of the region and provides technical and financial assistance to Vietnam. Cooperation also provides opportunities for Vietnam to work with other regional countries to develop solutions to common problems. For example, recent cooperation with NACA, FAO and OIE has focused on developing solutions to aquatic animal disease problems, which are common within the Asian region.

115. Vietnam also collaborates with several international organizations involved in fisheries and aquaculture development and economic cooperation, such as FAO and Asia Pacific Economic Commission (APEC) and standard setting for international trade, such as OIE (standards setting in animal health, including aquatic animals), CITES, and Codex Alimentarius. MOFI has little experience in international standard setting, and in some cases (as in the case of OIE standard setting) is not even the contact point (which is in MARD). More active future engagement will be essential to keep up-to-date with international trading standards, and to voice Vietnam's concerns to standard setting bodies.

Education Institutions

116. The Ministry of Education and Training provide funds for education and training in fisheries sector and aquaculture sub-sector.

117. Nha Trang Fisheries University is a substantial academic institution, with a total student body of 10,000 and 400 permanent academic staff. About 1,700 undergraduate and 150 post-graduate students receive degrees each year, including around 10 with PhDs. NORAD support has been provided for capacity building at the University for four years beginning in 2003. In addition there is a vocational school (for school years 13-14 that issues certificates) and a college for diploma training with intakes of about 300 and 200 per year, respectively. The university offers a wide range of courses including: fish technology; maritime safety; oceanography; marine engineering; food technology (including seafood processing); fisheries economics; aquaculture; and environment and fisheries resources management. Some difficulty has been experienced in attracting students for the marine fisheries courses, despite a number of inducements. Aquaculture is more popular. The University has substantial research capability, which again is strong in aquaculture, but weak in fishing technology and resource assessment and management.

118. Can Tho University was founded in 1966 and offers training programs leading to BSc, MSc and PhD degrees, with an emphasis on the Mekong Delta. Its College of Aquaculture and Fisheries provides training for about 50 BSc-level and 10-15 MSc-level students per year. The institute has 24 teaching staff, 59 research staff and 10 technicians. The College is well located for research in the

Mekong Delta and has good research facilities. The college staff have been involved in several nationally and internationally-funded research and development projects including: (i) a Dutch-funded project for institutional capacity building for freshwater aquaculture farming systems (the so-called West-East-South program), (ii) a JIRCAS (Japan)-funded program on new farming technologies, (iii) an ACIAR (Australia)-funded project on the sustainability of integrated rice-marine shrimp systems and shrimp domestication, and (iv) locally-funded projects on the development of integrated prawn-rice systems, seed production of freshwater prawns (*Macrobrachium*) and catfish (*Pangasius* sp.), on the culture of mud crabs, and on the production of *Artemia* in salt ponds.

119. A four additional universities conduct BSc courses in aquaculture:

Vinh University;
Hanoi Agriculture University in collaboration with Research Institute for Aquaculture 1;
University of Hue;
College of Agriculture and Forestry under the State University of Ho Chi Minh City; and
MSC aquaculture course of study at course at RIA-1 in collaboration with Hanoi Agricultural University.

120. Total annual output of graduates in aquaculture-related areas is about 500. There are three colleges of central government and one provincial providing formal and non-formal education and skill training for technicians. In addition, there are several provincial technical schools or colleges that offer formal and informal training on technology in areas of agriculture and aquaculture. Some provincial schools train in aquaculture, fishing boat mechanics, fisheries, navigation etc. Some vocational schools conduct on-the-job training. Many graduates at all levels now work in the private sector.

121. Universities and schools face problems of poor facilities for practical work. Although they collaborate with production farms, their laboratory facilities and equipment are inadequate. The Universities and Colleges lack financial support for research. As a result, students are not able to access new techniques and research developments. The University of Can Tho is also undertaking a pilot project in aquaculture distance learning in collaboration with the University of Ghent. Vocational training is a major limitation, a factor contributing to the lack of skilled local level workers and poor quality of services to the aquaculture sector. There are two training institutes located in Hai Phong -- one belongs to MOFi (Fishery School 4) and one is under the Hai Phong DOFi. However, in the South where the fishing industry is concentrated, there is no training institution that owns a fisheries training vessel, limiting the capacity to train fishers, including new entrants or those wishing to crew for foreign vessels.

Mass Organizations

122. Mass organizations are an official and integral part of the Vietnam government system, forming a separate branch to the central ministry/provincial department structure. They are members of the Fatherland Front and are strongly represented in the National Assembly. They have their own budgets, staff and programs. The National Assembly defines their legal status and each has a congress, the apex body of the organization. The mass organizations have central executive committees and presidiums that manage their programs of activities.

123. In relation to fisheries and coastal zone development, the Fisheries Association of Vietnam (VINAFIS) is the key mass organization. The Farmers' Association, Women's Union and Youth Association are also important stakeholders that were formed in the early 1930s and have a well-established structure and membership. VINAFIS was established in May 2000, through uniting the former Aquaculture Association and the Fishers' Association. VINAFIS is a mass organization representing fishers, aquaculturists, fish processors and fisheries services. The main purpose of the association is to create an environment for its members in business in order to increase the value of production. It also seeks to reduce the impact of natural disasters and disease outbreaks, protect and

develop fish resources and protect the environment. The association represents its members and protects their benefits. The main activities of the association include:

- the extension and training of members;
- creating the conditions for the members to collaborate and coordinate their activities;
- collaboration with government extension organizations;
- promoting technological progress and transfer new technology to members;
- providing information on market price to members;
- assisting them to organize the improve their business operations;
- collaboration and coordination with other mass organizations and the Government in fisheries development; and
- establishing and developing international relationships with regional and international fishers and fisheries organizations.

124. In common with other mass organizations, the VINAFIS has a central board and provincial level associations. At the district and commune levels, where there are more than five members, a sub-association can be established. The association operates in most coastal provinces, but limited development has occurred to date at the commune level and in inland provinces. Membership of the association is expanding steadily and is currently around 20,000.

125. The Vietnam Association of Seafood Exporters and Producers (VASEP) was established in 1998 and has a membership of mostly the larger seafood processors, though it is growing yearly with added new members. VASEP has played an important role in providing advice to MOFI on trade policies and decisions, and has been active in the two antidumping cases.

Donor Programs, Projects and Cooperation

126. Overall, the fisheries sector has received relatively little bilateral or multilateral agency support over the past decade compared to other natural resources sectors. Given the sector's urgent need for improved management and its capacity to alleviate poverty and improve the coastal environment, higher levels of support are needed in future. ODA resources in the sector are limited, but play an important role, providing about 36% of public resources (Table A-8 in Appendix B). There is high concentration of emphasis on investment and investment-related technical assistance that comprises two-thirds of the ODA resources under 12 projects in 2003. This contributes to the imbalance between investment and maintenance and operation funding in the sector. Fifty smaller stand-alone technical assistance projects contributed just one-third of the total ODA. A list of selected ODA projects relating to fisheries, aquaculture and ICZM is included in Appendix F.

127. A number of agencies are presently supporting Vietnam's fisheries sector. Significant contributors include DANIDA, NORAD (in relation to fisheries legislation formulation and coming implementation) and to a lesser extent AusAID through ACIAR and the EU which provides some support to research. ADB has also been involved significantly in the past.

128. The main program assisting the sector at present is the DANIDA-funded Fisheries Sector Program Support (SPS) with five⁷ separate components covering marine fisheries, seafood processing, state enterprise restructuring and aquaculture sectors. ADB conducted a Coastal Aquaculture Development Study in 1996, combined with an investment project pre-feasibility study. While the study was useful for developing MOFI aquaculture planning capability, the project did not proceed, mainly due to ADB's prior investment in the Fishing Infrastructure Improvement Project. DANIDA also provided support for the initial fisheries master planning study over the period 1995 to 1997, laying a foundation for subsequent long-term planning activities. The program for MPA establishment

⁷ Support to Brackish water and Marine Aquaculture (SUMA), Support to Freshwater Aquaculture (SUFA), Strengthening of Fisheries Administration (STOFA), Seafood Export and Quality Improvement Programme (SEAQIP), Support to Industry Restructuring and Enterprise Development (SIREN) (http://www.dk-vn.dk/dev_fishery.htm).

(with a series of 15 MPAs planned mainly for island locations along Vietnam's coast between the Tonkin Gulf and the Cambodian border) was funded by ADB in about the late 1990s.

129. UNDP has supported several projects targeting poverty alleviation through aquaculture, including a mountain aquaculture project (VIE/98/009) and one related to livelihood development of coastal communities through aquaculture and better environmental management of the coastal environment. The experience gained under the UNDP projects has been instrumental in convincing government and donors of the potential of aquaculture for poverty alleviation in Vietnam.

130. Some support to aquaculture is provided through ongoing rural development projects, and for example through the World Bank's Coastal Wetlands Protection and Development Project, Water Resources Assistance Project and Northern Mountains Poverty Reduction Project. Investments in livelihoods development in these projects can include fresh or brackish water aquaculture development.

131. At present there is no overall consultative group for fisheries. In future, consideration could be given to establishing such a group involving key donors to the sector, MOFI, other involved ministries (MOF, MPI, MONRE, MOST) and other stakeholders (e.g., VINAFIS, VASEP, MONRE, NGOs). A model for this may be the International Steering Group on the Environment (ISGE), chaired by a vice-minister of MONRE. In practice, because many of the activities in the fisheries sector have an environmental overlay, consideration could be given to establishing a sub-group for fisheries within the ISGE. This could be similar to the sub-group on ICZM that was established in 2003. MARD also operates a steering group – the International Support Group (ISGMard), which runs an effective newsletter in English and Vietnamese, provides information on projects and sector development and promotes coordination among projects and donors.

Public and Private Sector Cooperation and Stakeholders

Public Commercial and Service Activities

132. Currently, the MOFI controls three large holding companies (East Sea Fisheries General Corporation, Vietnam Fisheries General Corporation, and Ha Long Fisheries General Corporation). The three corporations have 51 member enterprises, of which 10 have been equitized. Based on the principles to separate economic management from state management, MOFI only manages in term of overall organization, approving development plans, deciding the appointment or dismissal of staff for key positions, including board membership, general directors and heads of inspection teams, making decisions on the establishment, liquidation, equitization, leasing or bankruptcy of a company. In general, state-owned companies are not highly effective. According to an assessment quoted in the Fisheries Master Plan, 20% of enterprises operate at a loss, 40% of enterprises breakeven, and 40% make small profits. Of the 51 member enterprises, six own fishing fleets; but three are operating at a low level; and three have ceased operation. There are three public sector aquaculture enterprises, of which one is entering bankruptcy. In processing and domestic trading, there are a few small enterprises under the fisheries general corporation; three of them are located in Hanoi (Fisheries Company No. 1, Central Fisheries Company, and the Phu Quoc Fish Sauce Company of which one is located in the central (Fisheries Company No. 2) and one in the south (Fisheries Company No. 3 in HCMC).

133. Most coastal provinces own one or more state enterprises in the fisheries sector. These are also often unprofitable. According to ADB (1995), most SFE operations are in the following sectors:

1. marine fishing;
2. aquaculture and aquaculture services;
3. fisheries processing;
4. shipbuilding, mechanical engineering, and refrigeration engineering;
5. nets, gear, packaging, and materials supply;

6. fisheries import-export activities;
7. fisheries marketing and trading fisheries products for domestic consumption; and
8. construction for fisheries.

Joint Public and Private Sector Activities

134. In Khanh Hoa and Binh Thuan, some industrial parks for aquaculture have been set up with the Government providing the basic infrastructure. Decree 106 was partly implemented through government investment in infrastructure, with water supply and drainage projects for shrimp farming areas being built in most coastal provinces. Farmers are then responsible for investment in individual farm plots within the infrastructure. In practice, the projects were marred by poor environmental planning, limited financial resources and lack of effective local management arrangements. Most DOFIs visited during sector study field trip have plans for further zoning of aquaculture areas, based on a mix of government and private sector funds. In Khanh Hoa, for example, DOFI has an ambitious project to relocate all shrimp hatcheries into designated hatchery zones, with government investment in infrastructure and private sector investment in the hatcheries and necessary services.

135. Under the FIIP, the fishing port authorities were intended to promote the establishment of port user associations (PUAs). These would bring together all main stakeholders and provide input to the management, operation and development of the port. In practice this has not yet happened, though a government circular in early 2004 directed this. Although formal PUAs have not been established, port managers are consulting widely with stakeholders such as fishers, ice plants, processing plants and agents.

136. Research Institutes provide consulting services. For example RIA1 has government budget for 127 staff, but employs around 430 staff by earning revenue from commercial activities such as consultancy activities, research contracts and the development of commercial extension activities.

Non-government Organizations

137. A number of NGOs has been increasingly active in the aquaculture sector in Vietnam.

- Action Aid has been actively involved in the two antidumping cases, soliciting farmers' opinion about the impacts and advocating against the US decision.
- IUCN has been active in development of marine protected area (MPA) project in Nha Trang (Hon Mun) and has included aquaculture as an alternative livelihood activity for fishers.
- Worldwide Fund for Nature has been active in Con Dao marine park assessment, development and monitoring.
- Some NGOs such as Oxfam working in the field of poverty alleviation have started programs in Vietnam to promote aquaculture as a means of income generation in rural areas.
- Some international environmental NGOs also began operating in aquacultural production fields to introduce issues regarding environmental development, including recently Oxfam and the Environmental Justice Foundation. Investigations and campaigning are slowly raising the profile of environmental and social issues in the shrimp-farming sector in Vietnam both nationally and internationally.

138. NGOs and mass organizations have played an important role in support services at the local level and will be crucial in expanding aquaculture. Experience from the Mekong basin, for example, indicates that aquaculture has proven risky in instances where it was promoted without effective extension support and applied inappropriate, high-cost technology, without understanding the socio-economic constraints of rural households (Phillips 2002). Because lack of people and resources are a constraint to extension systems, Government needs to partner with both the private sector and NGOs.

Mass media can be used, along with other new approaches to spreading information. Women's organizations, such as the Women's Union, have also been used. There is also a need for integrated approaches to extension and service provision at the local level. The decentralization processes now being seen in Vietnam, combined with the possibility to develop local farmer groups provide excellent entry points for better organization and management of the sector. Given the growing expertise with NGOs, it is highly desirable that they become more engaged in the development of sectoral policies and strategies.

Support Services – Constraints and Opportunities

139. The private sector is now responsible for most service provision in fisheries and aquaculture. Boat building and ice, fuel and spare parts supply in fishing ports are almost all through the private sector. Similarly, in aquaculture, seed and feed supply and marketing services are almost all provided by private companies, traders and business people.

Services to Capture Fisheries

140. Until the mid-1990s, Vietnam's fisheries sector was poorly serviced. Most large-scale fishing was conducted by national and provincial state enterprises, which were more or less self-sufficient in terms of ice and fuel supply and boat and engine repairs. With the rapid expansion of the private sector since then, service supply has developed rapidly. Ice supply is adequate at major ports, provided from numerous block ice plants. At minor ports and beach landings and in inland areas, ice can still be difficult to obtain.

141. There are two national and five Thai, Taiwanese and Korean companies in Vietnam manufacturing fishing nets and gear with a capacity of about 12,000 tons per year. Boat and engine repair has not fully kept pace with the development of the needs of the offshore fishery. Modern slipway facilities are also often not available.

142. According to the Fisheries Master Plan, there are now 700 shipyards with a total production capacity of around 4,000 vessels per year. Most vessels are constructed of wood by traditional shipyards located in villages and towns along the coast. Only two yards currently build steel vessels – in Ha Long and Nha Be. Most inshore boats are made by local groups or companies.

Port Facilities

143. Vietnam's port infrastructure has expanded rapidly in the last decade. The ADB-financed FIIP, which developed 10 ports between Cat Ba in Hai Phong province in the north and Ca Mau in the south. The project was completed in early 2004 and a project completion report was prepared which provides information on the project and its outcomes. The ports were intended to support and promote the development of the offshore fishing industry, and this objective was largely achieved. However, the project was overtaken by the rapid development of the fishery and the four successful ports – Song Gianh (Quang Bing), Thuan Phuoc (Da Nang), Phan Thiet (Binh Thuan) and Tac Cau (Kien Giang) – are already too small for the fleets they are trying to service. Other ports were improperly sited to achieve their intended purpose, at least for the short-term, though some such as the island ports of Cat Ba and Con Dao (Ba Ria-Vung Tau) serve other purposes such as transport terminals.

144. Provinces are also developing other ports, though some may not be strategically located to optimally serve the industry. Overall wharf length has increased from about 4,000 meters in 1997 to 10,000 meters in 2004. There are over 80 landing places for mechanized boats. However, few are fully suitable for large-scale offshore fishery use. The Japan International Cooperation Agency (JICA)-funded port at Vung Tau comes closest to this objective, followed by Tac Cau. The latter will require at least doubling in size to accommodate the Rach Gia offshore fleet which is being required to move out of the provincial capital. Overall, there is a need for a national port planning study, particularly to define the needs for servicing modern fishing vessels in the offshore fishery. There is

also potential to integrate fisheries and tourism at some fishing ports, for example in Cat Ba, Da Nang and other centers.

145. Some ports, such as those under the FIIP have basic facilities such as ice, water and fuel supply. Most ports serve larger offshore vessels with smaller vessels continuing to use traditional landing sites that generally have no support services. Ice supplies are now generally sufficient to meet the industry's needs, though all plants produce blocks which are less effective at fish cooling than the flake ice now used in more advanced fisheries. Processing plants have been established in several ports. In most ports, small- and medium-scale businesses have been established within the port area, providing a range of services supporting the fishing industry. None of the 10 FIIP ports included slipways or significant repair facilities, requiring vessels to travel to nearby or more distant facilities. Since vessel repair can be a significant income earner for ports and provides a valuable service to fishers, future port developments should consider inclusion of slipways and repair facilities.

Aquaculture

146. The supply of aquaculture inputs and services such as extension and credit play an important role in its sustainability. For poorer farmers, access to relevant extension services and credit plays a critical role in ensuring their participation and benefit from aquaculture development (DFID 2001).

Feeds and feed suppliers

147. Growing demand for aquaculture feed has resulted in an increase in the number of formulated feed suppliers, selling both domestic and imported brands. Feeds are available for freshwater fish and shrimp, catfish and tilapias, with limited import of marine fish diets, mainly for experimental purposes. Aquaculture in Vietnam is mainly practiced on extensive or semi-intensive so the amount of manufactured feed used is still limited, although growing. Homemade feeds are also used; cage farmers growing catfish in the Mekong River commonly use homemade feeds formulated from locally available ingredients.

148. Presently there are estimated to be 24 small feed enterprises producing about 50,000 tons of shrimp feed annually, located in central and southern Vietnam. Foreign investment in feed companies has also increased significantly in the past five years, including CP Group (Thailand), Uni-President of Taiwan, Proconco, Cargill, Cataco and Tomboy of France. According to the Investment and Trade Promotion Centre in Ho Chi Minh City⁸, the 13 largest companies are expected to produce over 400,000 tons of feed in 2004, with imports of 140,000-150,000 tons from Thailand, Hong Kong and Taiwan. Feed companies in the shrimp and catfish sectors are also actively involved in extension activities, providing training and extension materials. It is expected that private sector feed companies will continue to expand as demand grows.

Fish and shrimp seed

149. Freshwater fish hatcheries, nurseries and fry trading networks are now well established in most fish farming areas in the country. During the 1950s and early 60s farmers caught fish seed from rivers (mainly Red River) during the rainy season (June-July) with most concentrated fishing around the central part of the Red River delta (Hanoi and Hung yen province). Annually an estimated 300 to 700 million larvae of silver carp were caught. Wild seed collection continued till the mid-1980s even as hatchery seed became more easily available.

150. Fish seed production started in the early 1960s, when artificial propagation of Chinese carps succeeded, after which Chinese type hatcheries were constructed in most districts and provinces with potential for aquaculture development. In the South, the system was established at the end of the 1970s. Before reformation in the agriculture sector (1986), fish seed was produced by aquaculture

⁸ http://itpc.hochiminhcity.gov.vn/English/business_news/business_day/Folder.2004-07-27.1307/News_Item.2004-07-27.1616

cooperatives, but since this time the numbers of private hatcheries have expanded significantly. Presently, there are over 350 freshwater hatcheries, both government and private sector, producing more than 10 billion larvae and fry annually of common carp, silver carp, grass carp, silver barb, rohu, mrigal, catfish, tilapia and other cultivated species. Most hatcheries are located in lowland provinces especially in the Red and Mekong Deltas. In highland and coastal areas, there are few freshwater hatcheries. Small-scale nurseries and decentralized seed production and trading systems have been successful but could be further expanded, particularly in more remote mountain areas.

150. There are now more than 5,000 shrimp hatcheries, mostly small-scale enterprises located in Central Vietnam (65-70%) and the Mekong Delta. Most coastal provinces have small numbers of local hatcheries, but local supply in northern and southern areas is insufficient to meet demand, and Central Region remains the major supplier. Annual shrimp larvae production (mainly *P monodon*) is over 25 billion PLs. There is a major trading network moving shrimp seed from central hatcheries to coastal areas throughout the country. To exert some control over quality, a seed inspection and certification scheme has been established, presently operated by NAFIQAVED. The system needs substantial upgrading if it is to be an effective means of controlling quality control and disease problems in shrimp trade.

151. The bulk of marine fish fingerlings stocked in cages are wild caught, except the recent development of *Cobia* culture based entirely on hatchery-reared fish. It is estimated that local hatchery-produced fingerlings contribute less than 4% of total fingerling supply, imported seed (mainly from Taiwan and China) contributes around 5% and wild caught seed contributes more than 90%. The considerable stress on coastal fisheries in Vietnam suggests that hatcheries or hatchery imports will have to be the mainstay of future growth of marine fish culture. Marine fish hatcheries are found in Ha Long Bay in the north and central and southern areas. Considerable expansion will be needed if the MOFI target of 200,000 ton of marine fish production from aquaculture is to be achieved by 2010.

Aquatic animal disease control

152. Aquaculture in Vietnam faces significant risks from aquatic animal disease outbreaks, with the most dramatic economic losses in shrimp farming, but also losses reported in marine fish, and freshwater catfish and carp aquaculture. Services for disease control are improving but are still limited and insufficient to manage risks.

153. Aquatic animal disease surveillance systems are also starting to be developed. These will be required to respond to future aquatic animal disease problems, and for trade purposes. Capacity building for staff, improved management systems and investment in facilities are required to develop a comprehensive environmental monitoring and disease surveillance program for the provinces of the Deltas. Vietnam requires an effective aquatic animal disease control system for future trade purposes, based on international standards. The following elements (from FAO/NACA 2000) need to be considered in a national disease control strategy:

- aquatic animal pathogens to be considered;
- disease diagnostic capacity;
- health certification and quarantine procedures;
- disease zoning;
- contingency planning for disease emergencies;
- adopting import risk analysis; and
- institutional development, capacity building and policy development.

154. Subject to approval by the Minister of Fisheries, NAFIQAVED is developing a national advisory committee for aquatic animal disease control, one objective being to provide advice and coordinate implementation of aquatic animal disease control measures in .

Extension and Information

Extension to Fisheries and Aquaculture

155. The Ministry of Fisheries recently has set up a National Extension Center, renamed the former Central Extension Center, which is responsible for extension planning, coordination of extension activities throughout the country and implementation of some extension activities. Most extension has focused on aquaculture, and there is little to capture fisheries.

156. DOFis in coastal provinces operate Fishery Extension centers that are responsible for planning and organization of the extension activities in the province. The extension center coordinates activities between the districts where district units for fisheries exist. In addition, the center in many cases has also the responsibility to implement extension activities through local authorities or district agriculture extension units. Such complicated links require flexibility from both sides, the extension center and the local government responsible authority. In inland provinces, aquaculture extension activities are carried out or coordinated by the provincial DARD Extension Center. Implementation of extension activities in these provinces requires a strong link and collaboration between provincial and district field staff and key farmers/demonstrators.

157. The Research Institutes are also involved in extension activities. The focus is on building institutional capacity in the provinces, development of extension materials and consulting on development projects.

158. Despite considerable investment from responsible ministries and provincial agencies and institutions, extension remains a weak point in the chain of information flow to farmers. Lack of human resources at different extension levels to service large numbers of farmers is a major constraint. With some exceptions, aquaculture extension has largely been prescriptive rather than farmer-needs based. More adaptive, farmer-needs-driven aquaculture extension has been piloted recently with some success, such as through RIA 1 and the MRC READ project. A major challenge is to develop the support services and communications systems and networks needed to support small-scale aquaculture development in the major aquaculture areas.

159. Development of local support services is central to aquaculture expansion. Aquaculture has failed, or the risks are very high, where it was promoted without effective extension support, or focused too much on technology, without understanding the socio-economic constraints of rural households as also discussed in paragraph 138. Because lack of trained people and resources are a constraint to extension systems, government needs to partner with the private sector and NGOs. Mass media could be used, along with other new approaches to spreading information. Women's organizations, such as the Women's Union, have also been effectively involved in Vietnam. Integrated approaches to extension and service provision are needed at the local level. The decentralization processes now being promoted, combined with the potential to develop local farmer groups provide excellent entry points.

160. There are opportunities to build more effective partnerships among various development agencies working in aquaculture and rural development. Cooperation and sharing of experiences between stakeholders through effective extension and communication will be important if the intellectual and capital resources available are to be used to the best advantage.

Information

161. Information to the fisheries sector is mainly provided through MOFi. MOFi has an Informatics Center (FICEN) responsible for collecting and exchanging information related to the fishery sector. FICEN and the National Extension Centre publish regular newsletters. FICEN has built relationships with the libraries of the research and education institutions in Vietnam. The Center also has formal links with other international and regional agencies such as FAO, Infofish, the World Fish

Center, AIT and NACA/STREAM aiming to build capacity, improve information flow and exchange information. Nevertheless, the center is facing a number of issues. One of the serious issues is related to weakness of institutional capacity and poor infrastructure that limit the scope and area of the center's activities. Also, more than one institution in Vietnam collects fisheries production data, using differing methodologies, thus often inconsistent reporting. Clearly, this duplication and the systems of data collection need to be reviewed, reconsidered and standardized to assure consistency and accuracy and to eliminate costly redundancy.

Fisheries Sector Credit

162. Rural households, including those involved in fishing and agriculture, have access to credit or other sources of funds via formal and informal channels. The current main formal channels mainly include the Vietnam Bank for Agriculture and Rural Development (VBARD), Commercial and Industrial Bank (CIB), and the Bank for Social Policy (BSP – previously the Bank for the Poor, established in 1996). The BSP mainly provides subsidized loans to poor households (up to Đ5 million) and individuals. VBARD and CIB make larger loans to enterprises, community groups and in some instances households. The informal channels mainly involve loans and gifts from family members and friends. Generally, available formal credit for rural development and fisheries, in particular, is limited and cannot meet need for medium and long-term loans.

163. VBARD was established by decree in 1988. It is wholly owned by government with a statutory capital of Đ2,200 billion (equivalent to US\$ 150 million) and is supervised by the State Bank of Vietnam. Its total assets at the end of 1998 were valued at Đ36,000 billion, equivalent to \$2.7 billion. VBARD dominates the formal rural banking sector in Vietnam and provides about 75% percent of rural credit in the country. Its reported lending was to about a third of all 12 million rural households in 1998. VBARD has changed its operations and earlier emphasis on lending to the corporate sector in line with changes in the economy to become a competitive financial institution meeting the needs of farm and fishing households and emerging private sector enterprises. VBARD has improved the access of the poor and rural households to affordable financial credit and has been a catalyst for economic development. As one of the four state-owned banks, the VBARD was entrusted with a rural credit mandate in 1990; and it has expanded its network to the country's largest branch network covering all cities and rural areas. It has a staff of its 22,000 employees at a total of 1,291 branches made up of two regional banks, 61 provincial branches, 527 district branches (full coverage), 626 inter-commune banks and 75 mobile banks (ADB 2003). VBARD in the provinces reports difficulties with a proportion of fishing boat and aquaculture loans, the latter often due to poor siting and management of shrimp ponds.

164. To foster investment in fisheries and aquaculture, VBARD entered into a Memorandum of Understanding with MOFI in 2000 to provide credit to fisheries and aquaculture. MOFI agreed to assist VBARD with: (i) the formulation of a plan to lend to the sectors; (ii) providing technical extension assistance to borrowers; (iii) environmental review of proposed investments; and (iv) provision of a list of qualified borrowers. VBARD has agreed to conduct appraisals of credit requests.

165. For some of the poorer fishing households, access to credit is difficult due to lack of collateral. Moreover, these households hesitate to borrow due to risk and most often rely on help from each other with major financial needs such as the purchase of a boat or engine which are most often small, requiring no more than about Đ10 million for a 5 meter boat and 12hp engine. VBARD is currently wary of lending for offshore fishing, which is considered risky. Due to the overexploitation of near- and some areas of offshore fisheries, the general development focus is to reduce the fishing pressure to allow the resource to recover and be fished within economically sustainable limits. This means that many fishers would need to shift to other occupations. One option is to provide alternate occupation in aquaculture production and support activities and services. Provision of credit to such households would require capacity building and training in advance with a certificate of competence accompanying a loan application.

166. An important constraint for poor people's involvement in aquaculture is lack of savings and lack of access to credit. VBARD provides loans for brackish water and freshwater fish culture, provided farmers have a "red book" demonstrating "ownership" of the land as collateral. Credit should be analyzed as part of the process to support farm households entering into aquaculture. The special difficulties faced by poor households, who may have difficulty providing collateral, should be recognized and addressed by supporting agencies.

Markets and Processing

167. Under the market economy, product prices depend on the market – the interaction between supply and demand. Understanding of the market is thus critical to both long-term investment planning and short-term production and marketing decisions. Market information systems are not yet well developed, and will require attention in future if efficiency in the sector is to increase. Some aspects of marketing in Vietnam are discussed in this chapter. More detail is provided in Appendix K.

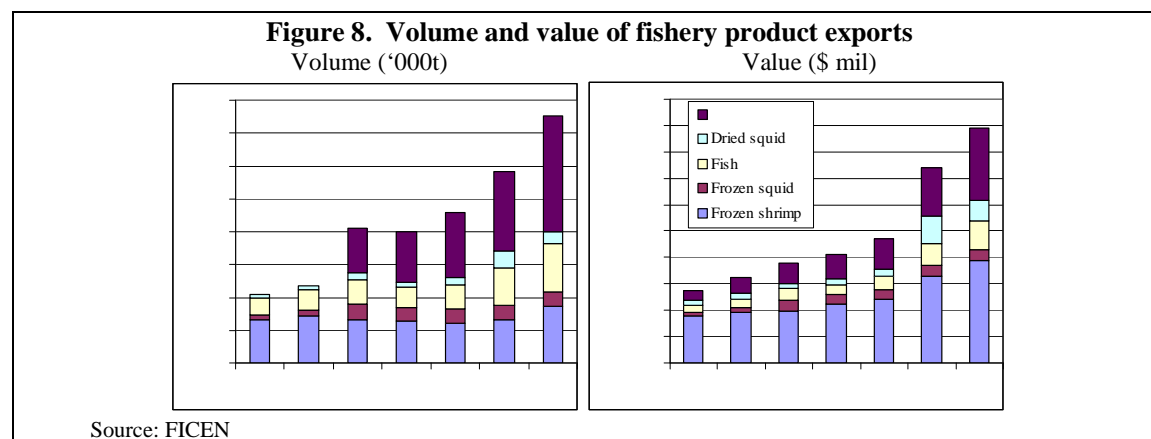
Market Channels

168. The marketing of fish, shrimp and other capture and culture products in Vietnam is complex. There are numerous species, product forms, marketing channels and markets. Products may be marketed live by farmers or sold to middlemen who collect product and sell to processing plants (or in the case of shrimp fry or grouper fingerlings, to other producers).

169. Marine fish are normally sold to agents at the port or jetty. Fishers often develop long-term relationships with market traders or wholesalers who provide them with credit for fuel, ice and other supplies, and can provide finance for off-season needs or even assist with vessel purchase. Offshore vessels, fish may be sold at sea to buyers on transport vessels or collector vessels run by their agents. Where marine product processing plants are present, vessels may contract to supply them with product. Factories can seek product over a wide area. In the north, significant quantities of fish and other products are purchased by Chinese agents using collector vessels. Aquaculture products follow a similar path, though some producers contract directly with processing plants. Almost all processed aquaculture production (96%) is destined for export. Fish from aquaculture are often sold live in local or city markets.

170. Few data are available on producer or retail prices. The most detailed data are for the Mekong, which suggest that the price for large shrimp have increased over the past 12 months (from about \$120,000 to \$130,000/kg for shrimp over 50 grams (<20/kg). Prices for smaller shrimp (41-50/kg) have declined from around \$85/kg in July to August 2003 to around \$70/kg for the same period in 2004. For carps in the Hanoi market in 2001, the retail price of \$22,400 represented a markup of 59% on the farm gate price (Dang & Ruckes 2003). For major carps, the markup was 62%. Overall, distribution and marketing margins are low, suggesting an efficient marketing chain.

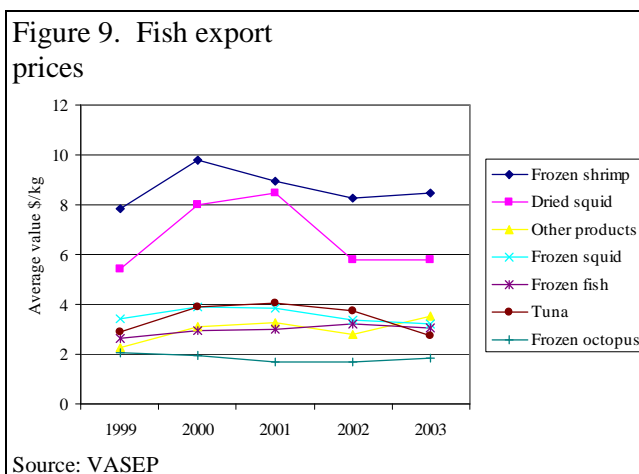
171. Export volumes and values over the period 1995 to 2001 are given in Figure 8. Total export value was \$1.8 billion in 2001 and in 2003 reached \$2.2 billion. Shrimp contributed \$1.14 billion (52%). In 2004, export values are somewhat lower, and are unlikely to exceed 2003 levels.



172. Average export prices according to VASEP over the period since 1999 are summarized in Figure 1. Prices reached a peak for several products in 2000/01, particularly for frozen shrimp and dried squid. Prices have subsequently trended downwards. The price decline for shrimp has been reflected at the farm gate.

173. There have been a number of studies of fish consumption in . FAO food balance sheets indicated that average consumption in Vietnam increased from 13.2 kg/person in 1990 to 18.7 kg in 2000 (reported in Lem 2002). The same study suggested that fish consumption was

almost three times as high as from other animal protein sources. An annual nutrition survey in 2000 reported annual consumption of 24kg/person nationally, ranging from 12 kg per person in the north to a high of 33 kg in the Mekong Delta.



Processing

174. The processing sector has expanded rapidly over the past few years, particularly with the development of large modern facilities particularly in the south in Khanh Hoa and most Mekong Delta provinces. There are about 400 registered processing plants in Vietnam with around 0.8 million tons input capacity. According to (Dang & Ruckes 2003), 74% of processors had Hazard Analysis at Critical control Points (HACCP) certification, 54% were Good Management Practice certified, 24% had EU certification while 16% were ISO certified. Of registered processing plants, 80% were in the south, 12% in the central and 8% in the north regions of . By 2003, 100 enterprises and 8 mollusk production areas were certified for the EU market. A majority of the plants process shrimp. Frozen shrimp exports were 56,000 tons in 2000, and have subsequently increased. Other products include particularly clam, swimming crab, snail, mud crab, oyster and scallop which in total contributed 77,200 tons to exports in 2000, or 26% by volume of total exports.

175. A total of 43 companies and many thousands of small enterprises process fish products for domestic markets with a total input capacity about 330,000t/year (Fisheries Master Plan). Products include fish sauce, dried products, fishmeal and frozen and chilled products. Dried products are popular with small businesses as they are simple to make and do not require complicated facilities and technology. The main products are dried squid, fish, shrimp, seaweed (*Gracilaria*) and products dried with spices.

Export Market Challenges

176. As aquaculture products have made an increasingly important contribution to export value and trade in fishery products, Vietnam has faced increasing problems with various international trade measures. Vietnam has made substantial investment in upgrading the quality of its seafood processing factories, and HACCP and EU and Japan health and hygiene standards are now being widely adopted. Nevertheless, recent events and trends show that significant challenges remain for Vietnam to be competitive in the international market for aquaculture products that go beyond processing plant quality control and processing technology. Aquaculture is likely to be the main supply for higher value exported aquatic products; therefore considerable investment in addressing trade-related constraints is needed to remain internationally competitive. In part due to the great success in penetrating export markets, there have been a number of recent developments that have resulted in export bans or limits.

177. Catfish were subjected to US anti-dumping legislation in 2002. Vietnamese exporters have been highly successful in identifying new markets for processed catfish, which are now exported to more than 40 markets. Exports to Europe have increased by 250% since 2003 and to the Pacific region by 350%. The number of processors exporting catfish has increased from 16 prior to the introduction of tariffs to more than 30. The farm gate price of catfish in the Mekong Delta has reached a record €15,000/kg.

178. The proposed US shrimp anti-dumping tariffs (planned for imposition in China and five other countries in addition to Vietnam), could cost exporters fines of between 12 and 93% of FOB value. The impact of this would be significant in the short-term, but many exporters view shrimp as a commodity and expect the markets to even out such pricing issues quite quickly. In addition to the anti-dumping measure, the shrimp-farming sector in Vietnam is being influenced by several macro-level, market-related trends, including:

- increasingly stringent food safety and quality standards;
- certification and trace-ability;
- importing country awareness of social and environmental issues in shrimp farming; vertical integration in the shrimp industry to control costs and risks; and
- trends towards lower farm gate prices.

179. Further information on the catfish and shrimp anti-dumping cases and other market impediments is in Appendix K.

180. **Food safety** represents a major challenge faced by Vietnamese fisheries in relation to market access, especially to markets in the EU, followed by the United States and Japan. Internationally, there is also an increasing trend towards trace-ability and application of HACCP at the farm level to reduce risks of contamination in the production process, particularly antibiotic residues. This raises significant challenges for all in the shrimp sector in Vietnam, but perhaps most to the many thousands of small-scale producers involved, connected to markets only by fragmented market chains. While implementation of effective sanitary and phyto-sanitary (SPS) measures in the shrimp sector will enable the country to remain competitive on international markets, the implications for poorer farmers could be significant. The implementation of HACCP and food safety management at the farm level requires knowledge and skills and investment in infrastructure and extension. Poorest producers – due to limited human, social, financial assets – are likely to find it most difficult. The need to assure the quality of inputs and trace-ability and verification procedures may also make it difficult for anything but the most organized input suppliers (feed and seed) to comply again putting at risk substantial numbers of people, for example in the shrimp seed business.

181. **Certification** of shrimp aquaculture products is slowly coming to the international scene, partly in response to food safety concerns, but more generally in response to consumer and NGO concerns over sustainability of shrimp farming. Certification represents a major challenge and will require substantial investments in farmer organization, support to implementing certification standards and a well-organized certification system. It is inevitable that poorer farmers will find it most difficult to participate in such schemes, unless substantial focused support on the small-scale sector is provided.

182. **Environmental and social awareness in importing countries:** Although food safety is probably the most significant issue influencing shrimp imports at the present time, there is evidence of increasing awareness of the environmental and social issues in importing countries and regions. Following a major campaign by a UK based NGO, for example, UK supermarkets have been exploring accessing shrimp produced and processed in “socially responsible” ways. In the US, NGOs are increasingly targeting consumers with campaigns about the environmental and social implications of seafood. This appears to be slowly driving the industry towards certification and industry assurance systems that address social and environmental issues.

183. All these trends point to increased vulnerability and difficulties for the small-scale coastal shrimp farmer and point to the need for diversification of product away from the more risky shrimp sector to other products, as well as diversification of markets. Finally, the growth of demand for fishery products in China and potential for competition with China are likely to have a significant influence on the demand and markets for Vietnam's fishery and aquaculture products.

Future Demand and Price

184. Local demand for fish and other seafood products is expected to increase rapidly over time due to population growth, increasing real incomes and health factors. While little if any growth can be expected in marine capture landings, and declines are possible, production from aquaculture has the potential to expand rapidly to meet this demand, it is expected that average real prices will remain reasonably stable. However, given the reported inelastic demand, substantial short-term fluctuations are likely.

185. Export prices are governed by a range of factors, many outside the control of Vietnam. Processed shrimp are the dominant export from Vietnam, and its price prospects are critical for the future viability of brackish water farms along much of the coastline. Shrimp price has been trending downwards and there are few factors leading to optimism about future prices. However, Vietnam is a low cost producer and should be able to weather market shocks better than some of its competitors (such as Thailand or China). Future demand for shrimp products is likely to grow, and this could be encouraged by improved brand-naming and promotion of Vietnamese product. It is becoming harder to produce large shrimp from aquaculture, suggesting that in the medium term, price for larger shrimp (<40/kg) will increase or at least remain at about their present level, while downward pressure is likely to continue on smaller sized shrimp.

186. Combined with the increased investment in food safety and quality control systems, noted below, the price trend can be expected to have increasing implications for competitiveness of small-scale farmers. One option is to explore economies of scale and efficiencies in the small-scale farming sector through working together, probably through more organized cooperation or self-help groups of farmers. Without a concerted focus by government and industry on the small-scale sector, there may be serious social implications in coastal farming communities.

Market Development Needs

187. Major market development needs include:

- improved market intelligence for fishers/farmers, with provision of price information on a daily basis to assist them in making short-term and long-term marketing and investment decisions;
- further development of the national cold chain to promote more efficient and hygienic preservation and marketing of fish
- increased investment in wholesale marketing, possibly including major city auction establishment; and
- training for agents, wholesalers, retailers and processors.

188. In future, consideration should be given to collecting and disseminating detailed price data on a daily or weekly basis. Study of collection, analysis and dissemination systems is merited.

Development Priorities and Next Steps

189. The Vietnamese fisheries and aquaculture sectors are large and complex. They are socially and economically important, supporting the livelihoods of several million people in coastal and inland areas. The sectors have evolved rapidly and have made a major contribution to the country's economic and social development. However, it is apparent that several sectors are experiencing

problems of (for example) over-fishing, lack of adequate planning (e.g., for aquaculture) and limited enforcement capacity/capability. Recent changes in the legislative environment, such as grass-roots democratization and the new fisheries law have created a policy environment from which substantial improvements in fisheries and aquaculture management can be introduced.

190. Internationally, and in Vietnam, it has been recognized that the best approach to fisheries management is through consultation with fishers and the development of shared management responsibilities through partnership between fishers and government. This approach can greatly facilitate introduction of measures required for sustainable fisheries development and management. The staff and budgetary resources of national and provincial governments are too limited to manage complex inshore fisheries effectively. They are unlikely to be able to enforce offshore fisheries management measures without the support of the majority of fishers. Co-management – the development of a partnership between industry and government for the management of natural resources – is considered to be the optimal and perhaps the only way in which Vietnam’s fish stocks can be conserved and effectively managed and harvested, and fisheries and aquaculture development made more sustainable. Vietnam’s planners and policy makers have recognized this and are strongly supportive of the types of interventions required for effective resource management.

191. This chapter summarizes major development priorities and next steps for the sector to develop based on principles of shared management, or co-management, in fisheries and aquaculture planning, development and management. The chapter synthesizes the wide range of recommended actions identified during the Sector Review (the detailed list is provided in Appendix K) organized around four headings of:

1. Integrated Coastal Zone Management;
2. Fisheries Management;
3. Diversified Aquaculture Development in Brackish, Marine, and Freshwater Areas; and
4. Marketing

192. The framework presented here provides the basis for a program potentially suitable for a joint government-donor program of support to the sustainable development of the sector with special reference to environmental management and poverty reduction. It is recognized that the framework is preliminary, requiring further study and consultation necessary to develop the elements into a coherent and viable program.

Poverty and the Environment

193. The focus of proposed fisheries and aquaculture sector interventions should be on poverty alleviation and environmental management. The two aspects are closely linked, since environmental sustainability is the key determinant of success in natural resources management. All program areas thus have environmental overlays and more-or-less direct links to poverty alleviation. Offshore fisheries does have poverty impacts, since it generates high on-boat and downstream employment (e.g., in processing) but a less direct impact on poverty reduction compared to coastal and inland aquaculture and inshore coastal and inland fisheries management.

194. Much of the “overarching” national policy is in place to support a more poverty-oriented approach to development of the aquaculture and fisheries sector. The key priority now is implementation. The government’s program to support the 157 coastal communes classified as poor should be a central feature of any intervention in coastal areas. Thus provinces selected for focus will ideally contain a significant number of these communes, and/or have substantial need for improved environmental management. Inland fisheries and aquaculture development, particularly in mountain areas should also be included under the poverty focus, again with a central feature of support to poorer communes.

Suggested Program Areas

Integrated Coastal Zone Management

195. Development priorities: Many of the aspects of development of the coastal aquaculture and inshore fisheries sectors should be carefully planned and implemented to protect the interests of all stakeholders in coastal development. This implies a need for integrated coastal zone planning and management, collectively referred to as ICZM. ICZM is expanding rapidly in Vietnam with an evolving institutional structure (under MONRE) and projects underway or planned in eight provinces. Under any fisheries sector project involving coastal zone development, it will be desirable to work within an existing or develop a new ICZM framework.

196. Next steps: For provinces currently without ICZM, the steps involved might include:

- i. Review of existing coastal zone planning processes;
- ii. Capacity building and awareness-raising for provincial, district and commune planners;
- iii. Conduct a survey of present resources and area usage;
- iv. Develop a provincial coastal zone planning and management strategy (in consultation with all stakeholders);
- v. Develop a regional strategy in consultation with neighboring provinces;
- vi. Prepare development plans for key sectors and necessary zoning, covering such aspects as aquaculture, agriculture, tourism and recreation, urban development, industrial development, land and marine parks and protected areas, transport, waste management, pollution control, biodiversity management and other aspects of environment protection and enhancement and general coastal management;
- vii. Provide livelihood support, focusing on aquaculture, coastal fisheries and other economic activities, mainly in poorer coastal communes, particularly those covered by the 157 poor communes program; and
- viii. Consolidation and expansion of some fishing ports as described in paragraph 144 for Rach Gia.

197. While the process sounds straightforward, it is recognized that there are competing interests in the coastal areas of many provinces that can be difficult to reconcile. In any zoning that assigns development rights to different resource owners, the challenges will be to satisfy the interests of all stakeholders. Taking account of these pressures, the main beneficiaries should be coastal poor households and employment generation for them while concurrently assuring that others are not adversely impacted or compensated for any losses. These are major challenges. However, despite the difficulties, development of a transparent, consultative and integrated coastal zone planning process is essential. Regional integrated planning can also be introduced to ensure that boundary effects (e.g., development in one province that precludes or damages development activities in a neighboring province) are eliminated or at least reduced. Other advantages to regional planning should be more rational regional development. For example, not every province needs the same infrastructure such as an international airport, container port or sugar mill. Once the objectives have been defined, it should be possible for provinces to plan their development and major investment projects within a coherent regional framework with consideration of tradeoffs among competing interests. To achieve this, an ICZM Committee needs to be established at the provincial level chaired by a Vice Chair of the PPC with representation of all involved provincial departments and representatives from other key stakeholder groups.

Fisheries Management

Inshore Fisheries

198. Development priorities: Traditionally, fisheries management in Vietnam has been the responsibility of the government. However, agencies such as DOFI have lacked the resources of staff or budget to provide the required management, monitoring, surveillance or enforcement of Vietnam's inshore (or offshore) waters. With increasing population pressure and the development of more effective (and/or destructive) fishing gears, inshore resources have been increasingly over-exploited or destroyed. In this situation, almost the only option for improved resource management is co-management, the sharing of responsibility for resources management between local communities and government agencies. Such an approach is easier when countries have a tradition of resource ownership by communities, as in much of the Pacific. In a situation such as that in Vietnam where marine resources have traditionally been open access, leading inevitably to a "tragedy of the commons", it is more difficult but not impossible.

199. Vietnam also has some history of community resource management. Some inland resources were managed by villages as were the forest resources by some ethnic minority groups. However, even where inshore resources are shared, rights can be allocated if the national legislative framework is adequate. The new fisheries law provides the potential for this under Clause 9, providing the basis for provinces to develop co-management systems with local communities. Some provinces have already started on such developments, both through the national MPA program (with island MPAs involving co-management at Cu Lao Cham, Hon Mun and Con Dao under donor financing) and on a smaller scale in mainland inshore waters in (at least) Quang Ninh, Khanh Hoa, Binh Thuan and Yen Bai, though these activities are in the early stages for which considerable knowledge has been obtained and major lessons learned.

200. Next steps: It is proposed that a co-management program combined with alternative income generation be started in selected provinces. It is proposed that a co-management program combined with alternative income generation should be considered in selected provinces. In areas with potential for co-management, this could involve the following steps:

- i. Identification of communities with interests in near-shore waters;
- ii. Research into current and traditional resources through both diving and recall surveys;
- iii. Boundary demarcation depending on population, resources and traditional use through a series of meetings with communities and groups;
- iv. Development of a community fishery management plan, and gazetting it at the province, following a period for public review and discussion. The management plan could include such aspects as MPA establishment, fishing limitations (area or gear), mariculture and shellfish management, and possibly, the development of artificial reefs, fish aggregating devices and trawl/push net exclusion devices;
- v. Demarcation of the co-management and MPA zones by stakes or buoys;
- vi. Provision of support to the community from technical and legal perspectives, especially how the MPA could be adopted into the national network in order to receive official recognition and support;
- vii. As part of a future project, such a program could be integrated with inshore fisheries management, brackish water aquaculture where appropriate and more general livelihoods development;
- viii. Organization of low-input/low-output/low-risk aquaculture for poor coastal households while at the same time emphasizing the formation of marketing groups to better assure effective market access and benefits;

- ix. Where appropriate, assist in providing storm shelter for inshore vessels in association with estuaries or islands. Environmental factors should be taken into account; and
- x. Continue support for the national MPA program, through developing the scientific basis for MPA establishment and operation, and funding additional MPAs from the 12 not yet established.

Offshore Fisheries

201. Development priorities: Vietnam has recognized the need to manage its offshore fisheries. Article 15 of the Fisheries Law states that “the Government shall have responsibility to demarcate sea areas and fishing routes, shall authorize powers to relevant Ministries and sectors and provinces to ensure the close and integrated coordination between fisheries inspection forces at seas and fishing routes.” However, to date, the offshore sector has been considered to be under-exploited, and therefore has not required intensive management. While there is evidence that the offshore fishery is becoming increasingly over-exploited throughout the country’s EEZ, it is considered that the explosive growth in offshore fishing from less than 1,000 vessels over 90 hp in 1997 to nearly 7,000 in 2004 mandates the need for careful management. While few vessels carry fish finders at the moment, once fish become scarcer, there will be motivation to adopt modern and potentially destructive fish finding techniques. The increase in effective fishing effort will likely lead to the collapse of the fishery within 10 years as international experience suggests. Therefore, it is essential to introduce necessary management measures before the collapse in those areas still reasonably productive, rather than attempt to rehabilitate a fishery after the event. Nevertheless, for areas, such as the Tonkin Gulf, where fish stocks have been seriously over-exploited, a radical fisheries control and management program will be required for its rehabilitation. Definition of a detailed offshore fishery management program will require substantial research and analysis and particularly, in depth consultation with the fishing industry. However, discussion with boat owners during fieldwork for the Sector Review indicate that fishers are prepared to consider management measures, providing they are not disadvantaged relative to other fishers.

202. Accordingly, the rationale of containing expanded exploitation of those resources from the vagaries of continued unrestricted exploitation is by itself sufficient reason to give high priority to improving the currently rather ineffective sector governance and that the benefits of such a strategy would exceed the risks. Enforcement of the recently adopted Fisheries Law, particularly the decentralization of fisheries management and regulation, is a step specifically available to the government to take more effective action.

203. Next steps: Steps required for effective offshore fishery management in Vietnamese waters might include the following steps:

- i. Define and demarcate fisheries in consultation with industry and research agencies. Ideally this will include segregation of fisheries by species type, e.g., of fish, shrimp and squid trawl fisheries as well as area definition;
- ii. Establish a monitoring program, and prepare annual assessments of marine resources and fisheries to provide advice to industry and government for the sustainable management of fisheries;
- iii. Establish in consultation with industry a compulsory logbook system for the offshore fleet, with necessary supporting legislation, including sanctions for non-

- compliance. For such a scheme to be effective, necessary logbook retrieval and analysis systems would need to be in place;
- iv. Review and enforce license limitation program. Care will be required that owners cannot work around the limits – for example, if the offshore fleet is considered as vessels over 90hp, that there is not a rush to develop vessels with 89hp engines. Licenses will need to include strict area limits;
 - v. Define necessary fishing gear restrictions. If fisheries can be differentiated, introduce gear restrictions specific to individual fisheries. Thus fish and shrimp trawl nets could be differentiated through foot rope length, wing characteristics, bobbin size and height of opening. The key factor for fish trawls will be codend mesh size. The current range of 20 to 30mm stretched mesh lets few fish through. Definition of the desirable mesh size for different fisheries is required, taking account of by-catch ratios, trash fish catch and speed of trawling. In principle, a mesh size of between 50 and 100mm stretched might be suitable for fish trawling. Only by full agreement with industry following a research program could such a major change be instituted, effectively;
 - vi. Assess potential for improved gear design, such as fish exclusion devices in shrimp trawl nets and turtle exclusion devices in fish trawls. Possible introduction of net testing in flume tanks established in the region;
 - vii. In order to develop effective consultation with industry, support the development of VINAFIS as a democratic and powerful organization, representing fishers and fully or largely independent of government;
 - viii. Support the research needed for fishing ground and optimal gear definition;
 - ix. Initially develop with China, a management plan for the Tonkin Gulf fishery;
 - x. Overtime, introduce in full consultation with industry, management plans for all fisheries, including consideration of closed fishing seasons or seasonal gear restrictions in selected areas;
 - xi. Assess methods for allocating rights based access to fisheries, including transferable licensing, individual transferable quotas (if required to limit catches) and (in the long term) electronic/ remote fishing vessel monitoring. A trial vessel electronic monitoring activity could be developed under the proposed Tonkin Gulf management plan, perhaps with research shared between China and Vietnam;
 - xii. Review existing surveillance capacity and capability. Develop improved systems. Consider introduction of incentive system for DOFis where fishers (including foreign vessels) are caught breaking the law;
 - xiii. Provide incentives for fishers to move to other livelihoods and limit new entrants through a licensing system; and
 - xiv. Review fishing port needs, including the potential need to consolidate and expand a port as proposed for Rach Gia.

Inland Fisheries

204. Development priorities: Inland fisheries are important sources of fish and other aquatic products for rural people living in inland areas, including some of the poorest landless people. Some forms of inland fisheries development, such as stocking in reservoirs or small-scale water storage schemes within irrigated areas, may have potential for further development. Inland fisheries production could likely benefit from the establishment of sanctuaries to protect critical natural habits, appropriate gear, and closed fishing seasons during the main spawning periods in selected areas.

205. Next steps: Steps to assure the sustainability and livelihoods of people dependant on inland aquatic resources would include:

- i. Further assessment of the importance to the national economy and local farmers and poor inland fishers in reference to the trade-offs, particularly of flood control for agriculture;
- ii. Identification of appropriate management measures such as appropriate gear and closed-fishing seasons in selected areas; and
- iii. Establishment of sanctuaries to protect key breeding and nurturing habitats to sustain or improve productivity and biodiversity conservation.

206. As a starting point for future interventions, a review on inland fisheries should be prepared, with specific emphasis on the importance to the national economy and local farmers and poor inland fishers, biodiversity, and with special reference to the trade-offs, particularly of flood control for agriculture, and implementation of the new Wetland Decree as applied to inland wetlands.

Aquaculture

207. Development priorities: Aquaculture development is essential to meet anticipated future demand for aquatic animal products, but interventions are needed to improve environmental sustainability and poverty focus.

208. Next steps: Priority steps to increase the contribution of the sector to food supply, poverty reduction and improve environmental sustainability include:

- i. Support to aquaculture (and where relevant small-scale inland fisheries) as a livelihood option in rural poverty reduction and agriculture diversification programs, including ongoing/planned World Bank rural poverty reduction projects (Northern Mountain Project; Water Resources Assistance Project and proposed Agriculture Diversification Project);
- ii. Support to a new initiative for diversified and integrated marine aquaculture as an alternative coastal livelihood option, particularly for poor inshore fishers, closely oriented to the new Government 157 poor coastal communes program;
- iii. In the shrimp farming sub-sector, supporting improvements in environmental and social performance, through introduction of better management practices, investments in zoning and locally-managed infrastructure, improved service delivery and market incentives that reward better practice, reduce market risks for small-scale farmers and assure food safety. Unsuitable shrimp farming areas should be identified and other aquaculture options supported or environmental rehabilitation undertaken;
- iv. Development of diversification options in brackish water farming as a low risk option for poor people living in coastal areas, or small-scale shrimp farmers exposed to excessive market risks;
- v. Support to formation of local farmer groups with responsibilities for local-management of aquaculture and locally managed services centers (e.g., in disease control, water management, environmental monitoring, and access to market/technology/better practice information and perhaps credit). Using the local farmer groups and service centers as a focus, gradually extend networking to Provincial and national services (research, extension) and VINAFIS;
- vi. Strengthening of environment and disease surveillance systems in coastal and inland for monitoring and response to environmental trends and aquatic animal disease outbreaks in aquaculture areas. Effective coordination is needed with local farmer associations, Provincial administrations, MOFI and MONRES;
- vii. Investment and technical support for quality seed production as prescribed under Government Program 112 with emphasis on Government to maintaining aquatic

genetic resources, at least for the short-term and the private sector role for mass seed production. The role and incentives for the private sector to invest in conservation of aquatic genetic diversity (e.g., for maintaining genetic material for future aquaculture) also should be explored;

- viii. Support the above with an expanded capacity building program oriented towards vocational level training to strengthen the capacity of farmers, farmer groups, local administrations and service providers to effectively deliver aquaculture services and better approaches to local aquaculture planning and management; and
- ix. Generally support improved communications within the sector and with other stakeholders for sharing of better practice and experiences, at all levels, and encourage greater participation of the poor in policy making and planning.

209. The above represents a major undertaking. A pilot project approach, involving a combination of investment and technical assistance, would ideally be used to build and share experiences, gradually expanding the program pending outcomes of pilots and social, environmental and market conditions.

210. The program requires a combination of financial investment, such as infrastructure and operations, and technical assistance for capacity building. Too often in government investments, such as earlier 225 programs, there has been little attention given to building the skills and institutional capacity for management, resulting in mixed success and environmental problems. The challenge then will be to design a balanced program combining capacity building, institutional and policy development, together with financial investment to ensure a sustainable outcome. As a follow up, detailed strategies for the potential program elements should be prepared to identify the investment and technical assistance to implement such a program.

211. The vulnerability of small-scale farmers to market and price fluctuations and international trading standards will become increasingly apparent after Vietnam joins the WTO. This vulnerability of the sector needs to be managed, perhaps through focusing on local markets, building capacity among farmer groups, collaboration between small-scale farmers and commercial aquaculture investors, contract farming, provision of market information, creating links between farmers and markets, and possibly other options. A special study is therefore recommended on WTO and aquaculture in Vietnam to assist in developing policy on this critical subject area.

Marketing

212. Development priorities: All fisheries and aquaculture under the market economy needs to be market driven. Marketing in Vietnam is reasonably efficient and low cost, particularly for export products though is generally considered weaker for domestically consumed products. A number of actions are desirable to improve fish product marketing. Some are discussed under the aquaculture component, such as establishing traceability to the farm for all products as well as price monitoring and dissemination for effective decision-making. There is also need to explore whether support to the wholesale marketing sector could improve competition and prices for producers and consumers, improve hygiene, and foster increased production and benefits to poor communities.

213. Next steps: A comprehensive marketing study should thus be conducted to evaluate the efficiency of the marketing system, identify any gaps within it, and assess where unmet demand exists for products that can be met through aquaculture in particular in Vietnam. Improved price monitoring and reporting is required to promote effective decision making for investment, production and marketing as well as broad communication of daily price fluctuations to producers, particularly during harvest periods. Such a communication system via radio, television, and newspapers needs to be developed. There is also need to explore whether additional development support to the wholesale marketing sector to improve competition and prices for producers and consumers, can help foster further production and benefits to poor communities. Moreover, a strategy needs to be developed to (1) promote trade in the international and domestic markets; create and support trademark

development; promote diversification of species cultured through a market oriented approach to better assure financial viability and sustainability; (2) establish a system by which the source of aquatic products can be traced to the source, should a quality issue be detected along the market channels to the consumer; and (3) seek assistance from related and qualified institutions involved in market development of fish and other aquatic products. For more detail, see Appendix L, Section D for detailed comments from the workshop on the marketing needs in Vietnam.

Implementation, Coordination and Follow Up

214. The program elements outlined above address many of the management, environmental and poverty issues facing the fisheries sector. Once it has been approved by key stakeholders following necessary modification, it will need to be developed into a program for implementation. Assuming that the program contains several of the elements discussed above, it is evident that it will involve a range of agencies and other stakeholders. Coordination in the design and implementation of the program will need to be of a high order, for example between MOFI, MARD and MONRE, and at the provincial level through people's committee.

215. Given the complexity of the program, it will be desirable to implement it in a phased manner. Initially some of the concepts (for example of co-management and micro-MPAs) should be implanted at a pilot scale at a few communes in selected target provinces. This would allow the necessary research and development to be completed before attempting wider implementation (e.g., of offshore fisheries management plans). Priority in ICZM, aquaculture and near-shore co-management would be given to poor communes. However, it is important that pilot areas chosen are those with the strong interest and thus the highest or at least very high prospects for success.

216. As recommended by the study team, the Ministry of Fisheries should take the lead in formulating a program of support to the sectors' development. As the sector has strong linkages to other Ministries and agencies working in agriculture, rural development, poverty alleviation and the environment, the study team proposed the establishment of a fisheries sector steering group to assist in formulating the program and its coordinated implementation. This fisheries sector steering group may be organized as a branch of the ISGE under the Ministry of Natural Resources and Environment (MONRE), since this is already established and operates effectively. The ISGE already has an ICZM group. I. It will also be essential to link the program closely with donors working in fisheries and related sectors, including the DANIDA Fisheries Sector Program Support Phase 2 in particular, which is currently under design.

REFERENCES

- Aasen, B 2000 Household Adaptation in Coastal Economies. (Paper presented at the Scoping Meeting for the Sustainable Aquaculture Development for Poverty Alleviation in , Hanoi 23-25 May 2000)
- ADB 1996 Vietnam Coastal Aquaculture Sector Review – Final Report (TA 2382-VIE). Asian Development Bank, Manila, Philippines
- ADB 2003 Institutional assessment; Assessment and Strengthening of Coastal Management Institutions (TA 3830)
- ADB 2004 Fisheries Infrastructure Improvement Project, Project Completion Report
- Adger WN 1999 Exploring Income Inequality in Rural, Coastal Vietnam *Journal of Development Studies* vol.35, n.5 pp.96-119
- ALMRV 2002 Analyses of survey data from 2000 - 2001 and recommendations for survey program, Hai Phong
- Anbinh Phan 2003 The New “Catfish” War: United States v. , Woodrow Wilson School of Public Policy and International Affairs [includes numerous references and recommendations on policy]
- AusAID 2004 The Regional Poverty Assessment - Mekong River Region. Published by UNDP and AUSAID.
- Can Tho University (2004) Survey of the farming systems in the buffer zone of Tra vinh, Soc trang, Bac lieu and Ca mau provinces. Report prepared by College of Aquaculture and Fisheries, College of Agriculture. CWPDP Project World Bank. October 2003 – April 2004.
- Dang NV & E Ruckes 2003 Fisheries marketing in : Current situation and perspectives for development, DANIDA SPS MTF/VIE/025/MS
- DFID (2001) Poverty and Aquatic Resources in : an assessment of the role and potential of aquatic resource management in poor people’s livelihoods. Aquatic Resources Management Programme. DfID SEAsia, Bangkok, Thailand (www.streaminitiative.org/virtuallibrary)
- Duong Long Tri 2003 Fisheries Report, 15th Standing Committee on Tuna and Billfish, Honolulu, Hawaii,
- Edwards P et al 2004 A survey of marine trash fish and fish meal as aquaculture feed ingredients in . ACIAR report.
- EJF 2003 Risky Business: ese Shrimp Aquaculture – Impacts and Improvements. Environmental Justice Foundation, London, UK.
- FAO 1995 FAO Code of Conduct for Responsible Fisheries
- Government 2004 Decree 122/2004/ND-CP Regulating the mandate and authorities of legal sections within Ministries, ministerial-level agencies, institutions under Government, specialized agencies under People’s Committees of provinces and cities under the Central control and State-run enterprises
- GSO 2001 Rural, Agriculture and Fishery Census
- GSO 2001 2001 Rural, Agriculture and Fisheries Census
- Haylor, G. 2001. Report of the email conference on poverty and aquatic resources. Aquatic Resources Management Programme. DfID Southeast Asia, Bangkok (www.streaminitiative.org/virtuallibrary)
- Hong, PN & HT San 1993 Mangroves of . IUCN, 1993. 172 pp
- IMA 2001 Proceedings of the live ref fish trade workshop, International MarineLife Alliance, Hanoi
- Le Than Luu 2000 Aquaculture for Rural Development in FAO: Hanoi
- Lem A 2002? Economic Modeling and Fish Consumption, FAO Fisheries Circular Chapter 5
- MARD 2004 International Steering Group Monthly Briefing Issue No. 13 - August 2004
- MARD/UNDP 2003 National survey on farmer needs. Report of project VIE/98/004/B/01/99. Ministry of Agriculture and Rural Development and United Nations Development Program, Hanoi.
- McCullough B & Phung Giang Hai 2004 *The live reef fish trade in : a preliminary report from the field*, SPC Live Reef Fish Information Bulletin #8
- Minh, LT, DT Huong & NA Tuan 1996 Women in Cantho City are profitably involved in fish nursing activities’ *Aquaculture Asia Oct-Dec 1996*

| | | |
|--|-------|---|
| MOFI | | Fishery Sector and WTO Accession, World Bank |
| MOFI | 2004a | Fistenet http://www.fistenet.gov.vn [includes sustainable yield estimate] |
| MOFI | 2004b | Fisheries Sector Master Plan |
| MONRE | 2003 | Vietnam Environment Monitor – Water |
| Nguyen The Cong | 1998 | Improving OSH service for female workers, Formulation and implementation of OSH action program for female workers in the fish processing industry in Vietnam, National Institute of Labor Protection |
| Nguyen TT & M Phillips | 2004 | Policy Research – Implications of Liberalisation of Fish Trade for Developing Countries. A Case Study of . Draft document. Project PR 26109. June 2004. Strategy for International Fisheries Research (SIFAR, Rome, Italy. |
| Nho, Pham Van & H Guttman | 1999a | Aquatic Resources Use Assessment in Tay Ninh |
| Nho, Pham Van & H Guttman | 1999b | Aquatic Resources Use Assessment in Long An Province, (results from 1997 survey) AIT AquaOutreach Working Paper No. SV-52 |
| Oxfam GB | 1999 | <i>Tra Vinh: A Participatory Poverty Assessment</i> (in partnership with Tra Vinh Province, World Bank and DFID Hanoi) |
| Phillips MJ | 1998 | Freshwater cage culture development in the reservoirs of the Central Highlands of Vietnam. Report to the Mekong River Commission. Phnom Penh. 124 pp. |
| Phillips MJ | 2002 | Fresh water aquaculture in the Lower Mekong Basin. MRC Technical Paper No. 7, Mekong River Commission, Phnom Penh. 62 pp. ISSN: 1683-1489 |
| Phuong, Dan Minh | 2002 | The impacts of pesticide use in rice production on aquaculture in the Mekong delta: a dynamic model. EEPSEA Research Report. Available on line at http://www.eepsea.org |
| Rab M, MM Dey, A Mahfuzuddin | | Province, (results from 1997 survey) AIT Aqua Outreach Working Paper No. SV-51 |
| | | 2002 <i>Socioeconomics of Freshwater Fish Farming in Asia</i> , Policy Research and Impact Assessment Program WorldFish Center, Penang, Malaysia |
| SAPA | 2000 | Proceedings of the Scoping Meeting for Development of the Sustainable Aquaculture for Poverty Alleviation (SAPA), 23 rd -25 th May 2000. Ministry of Fisheries, Hanoi, . |
| Smith P (Ed) | 1999 | Coastal Shrimp Aquaculture in Thailand:, Key Issues for Research (ACIAR) |
| Tran Duc Luong | 2001 | An Alternative Design of Trawls for Offshore Fishing In , Nha Trang University of Fisheries |
| Tran V N, Dinh V T, Bui TTH, Trinh QT, Le VK, Tuong PL | 2004 | The shrimp industry in : status, opportunities and challenges. Unpublished report from the Department for Fisheries Extension and Socio-economic Studies (DFESS), Research Institute for Aquaculture No.1, Dinh Bang, Tu Son, Bac Ninh, highland aquaculture. |
| UNDP | 2001 | Report on Economic Valuation of Mangrove Sites |
| UNEP/GEF | 2002 | Unpublished FAO report on impacts of 1999 flooding on fisheries and aquaculture in the Mekong delta. FAO, Hanoi. |
| van Anroy, R. | 2000 | : <i>Voices of the Poor</i> (in partnership with Action Aid, Oxfam GB, Save the Children UK, and -Sweden MRDP, Hanoi) |
| World Bank & DFID | 1999 | |

APPENDIX A. DECREE 106: COASTAL COMMUNES FACING SPECIAL DIFFICULTIES

**Danh sách các xã đặc biệt khó khăn
vùng bãi ngang ven biển và hải đảo**
(Ban hành kèm theo Quyết định số 106/2004/QĐ-TTg
ngày 11 tháng 6 năm 2004 của Thủ tướng Chính phủ)

| | | | |
|--------------------|-------------------|---------------------|--------------------|
| 1. Tỉnh Quảng Ninh | Huyện Vân Đồn | 01. Xã Bán Sen | |
| | nt | 02. Xã Đải Xuyên | |
| | nt | 03. Xã Vạn Yên | |
| 2. Tỉnh Ninh Bình | Huyện Kim Sơn | 04. Xã Thăng Lợi | |
| | nt | 05. Xã Kim Hải | |
| | nt | 06. Xã Kim Trung | |
| 3. Tỉnh Thanh Hóa | Huyện Tĩnh Gia | 07. Xã Kim Đông | |
| | nt | 08. Xã Ninh Hải | |
| | nt | 09. Xã Tĩnh Hải | |
| | nt | 10. Xã Hải Lĩnh | |
| | nt | 11. Xã Hải Ninh | |
| | nt | 12. Xã Hải An | |
| | nt | 13. Xã Hải Yên | |
| | Huyện Quảng Xương | 14. Xã Quảng Thạch | |
| | nt | 15. Xã Quảng Lợi | |
| | nt | 16. Xã Quảng Thái | |
| | Huyện Hậu Lộc | 17. Xã Ngư Lộc | |
| | nt | 18. Xã Đa Lộc | |
| | Hoàng Hóa | 19. Xã Hoàng Thanh | |
| | nt | 20. Xã Hoàng Trường | |
| | nt | 21. Xã Hoàng Tiến | |
| | Huyện Nga Sơn | 22. Xã Nga Thiện | |
| | nt | 23. Xã Nga Tân | |
| | nt | 24. Xã Nga Điền | |
| | nt | 25. Xã Nga Thái | |
| | 4. Tỉnh Hà Tĩnh | Huyện Nghi Xuân | 26. Xã Xuân Trường |
| | | nt | 27. Xã Xuân Liên |
| nt | | 28. Xã Xuân Yên | |
| nt | | 29. Xã Xuân Thành | |
| nt | | 30. Xã Xuân Hải | |
| nt | | 31. Xã Xuân Phổ | |
| nt | | 32. Xã Xuân Hội | |
| nt | | 33. Xã Xuân Đan | |
| Huyện Cẩm Xuyên | | 34. Xã Cẩm Lĩnh | |
| nt | | 35. Xã Cẩm Dương | |
| Huyện Kỳ Anh | | 36. Xã Kỳ Ninh | |
| nt | | 37. Xã Kỳ Nam | |
| nt | | 38. Xã Kỳ Phương | |
| nt | | 39. Xã Kỳ Lợi | |
| nt | | 40. Xã Kỳ Xuân | |
| nt | | 41. Xã Kỳ Hà | |
| nt | | 42. Xã Kỳ Phú | |
| nt | | 43. Xã Kỳ Khang | |
| Huyện Can Lộc | | 44. Xã Thịnh Lộc | |
| Huyện Thạch Hà | | 45. Xã Thạch Lạc | |
| nt | | 46. Xã Thạch Bằng | |

| | | | |
|------------------------|-------------------|----|----------------------------------|
| | | nt | 47. Xã Thạch Bàn |
| | | nt | 48. Xã Thạch Hải |
| | | nt | 49. Xã Thạch Trị |
| | | nt | 50. Xã Thạch Văn |
| | | nt | 51. Xã Thạch Hội |
| | | nt | 52. Xã Thạch Định |
| 5. Tỉnh Nghệ An | Huyện Diễn Châu | | 53. Xã Diễn Vạn |
| | | nt | 54. Xã Diễn Trung |
| | | nt | 55. Xã Diễn Bích |
| | Huyện Quỳnh Lưu | | 56. Xã Quỳnh Lộc |
| | | nt | 57. Xã Quỳnh Thọ |
| | | nt | 58. Xã Quỳnh Liên |
| | Huyện Nghi Lộc | | 59. Xã Nghi Tiên |
| | Thị xã Cửa Lò | | 60. Phường Nghi Tân |
| 6. Tỉnh Quảng Bình | Huyện Lệ Thủy | | 61. Xã Ngư Thủy (Ngư Thủy Nam) |
| | | nt | 62. Xã Ngư Hòa (Ngư Thủy Bắc) |
| | | nt | 63. Xã Hải Thủy (Ngư Thủy Trung) |
| | | nt | 64. Xã Sen Thủy |
| | Huyện Quảng Trạch | | 65. Xã Phù Hóa |
| | | nt | 66. Xã Quảng Đông |
| | | nt | 67. Xã Quảng Văn |
| | | nt | 68. Xã Quảng Hải |
| | Huyện Quảng Ninh | | 69. Xã Hải Ninh |
| | Huyện Bố Trạch | | 70. Xã Mỹ Trạch |
| 7. Tỉnh Quảng Trị | Huyện Hải Lăng | | 71. Xã Hải An |
| | | nt | 72. Xã Hải Khê |
| | Huyện Vĩnh Linh | | 73. Xã Vĩnh Thái |
| | | nt | 74. Xã Vĩnh Thạch |
| | Huyện Triệu Phong | | 75. Xã Triệu Lăng |
| 8. Tỉnh Thừa Thiên Huế | Huyện Phong Điền | | 76. Xã Phong Chương |
| | | nt | 77. Xã Điền Hương |
| | | nt | 78. Xã Điền Hải |
| | Huyện Quảng Điền | | 79. Xã Quảng Lợi |
| | | nt | 80. Xã Quảng Thái |
| | | nt | 81. Xã Quảng Công |
| | | nt | 82. Xã Quảng Ngạn |
| | Huyện Phú Vang | | 83. Xã Phú Đa |
| | | nt | 84. Xã Vinh Thái |
| | | nt | 85. Xã Vinh Phú |
| | | nt | 86. Xã Vinh Hà |
| | | nt | 87. Xã Phú Xuân |
| | | nt | 88. Xã Phú Thanh |
| | | nt | 89. Xã Phú Diên |
| | | nt | 90. Xã Vinh Xuân |
| | Huyện Phú Lộc | | 91. Xã Vinh Hải |
| | | nt | 92. Xã Lộc Vinh |
| | | nt | 93. Xã Vinh Mỹ |
| | | nt | 94. Xã Vinh Hiến |
| | | nt | 95. Xã Vinh Giang |
| | Huyện Hương Trà | | 96. Xã Hương Phong |
| | | nt | 97. Xã Hải Dương |
| 9. Tỉnh Quảng Nam | Thị xã Tam Kỳ | | 98. Xã Tam Phú |
| | | nt | 99. Xã Tam Thăng |
| | | nt | 100. Xã Tam Thanh |
| | Huyện Thăng Bình | | 101. Xã Bình Hải |
| | | nt | 102. Xã Bình Dương |
| | | nt | 103. Xã Bình Nam |
| | Huyện Núi Thành | | 104. Xã Tam Hòa |

| | | |
|---------------------|----------------------|---------------------------|
| | nt | 105. Xã Tam Tiến |
| | nt | 106. Xã Tam Hải |
| | nt | 107. Xã Tam Giang |
| | nt | 108. Xã Tam Anh |
| | Huyện Duy Xuyên | 109. Xã Duy Nghĩa |
| | nt | 110. Xã Duy Hải |
| 10. Tỉnh Quảng Ngãi | Huyện Bình Sơn | 111. Xã Bình Phú |
| | Huyện Lý Sơn | 112. Xã An Bình |
| 11. Tỉnh Bình Định | Huyện Quy Nhơn | 113. Xã Nhơn Châu |
| | nt | 114. Xã Nhơn Hải |
| | nt | 115. Xã Nhơn Lý |
| | nt | 116. Xã Nhơn Hội (xã đảo) |
| | Huyện Phù Mỹ | 117. Xã Mỹ Thọ (ven đầm) |
| | nt | 118. Xã Mỹ Thắng (BN) |
| | nt | 119. Xã Mỹ An (xã BN) |
| | nt | 120. Xã Mỹ Thành (BN) |
| | Huyện Phù Cát | 121. Xã Cát Thành |
| | nt | 122. Xã Cát Khánh |
| | nt | 123. Xã Cát Minh |
| | nt | 124. Xã Cát Tiên |
| | nt | 125. Xã Cát Chánh |
| 12. Tỉnh Phú Yên | Huyện Tuy An | 126. Xã An Hải |
| | nt | 127. Xã An Phú |
| | Huyện Sông Cầu | 128. Xã Xuân Thịnh |
| 13. Tỉnh Ninh Thuận | Huyện Ninh Phước | 129. Xã Phước Dinh |
| | nt | 130. Xã An Hải |
| | Huyện Ninh Hải | 131. Xã Vĩnh Hải |
| 14. Tỉnh Long An | Huyện Châu Thành | 132. Xã Thành Vinh Đông |
| | Huyện Cần Giuộc | 133. Xã Tân Lập |
| | nt | 134. Xã Phước Vinh Đông |
| 15. Tỉnh Bến Tre | Huyện Thạch Phú | 135. Xã An Quy |
| | nt | 136. Xã An Thuận |
| | nt | 137. Xã An Nhơn |
| | Huyện Bình Đại | 138. Xã Thừa Đức |
| 16. Tỉnh Trà Vinh | Huyện Cầu Ngang | 139. Xã Mỹ Long Nam |
| 17. Tỉnh Sóc Trăng | Huyện Kế Sách | 140. Xã Nhơn Mỹ |
| | nt | 141. Xã An Lạc Thôn |
| | nt | 142. Xã An Lạc Tây |
| | nt | 143. Xã Phong Năm |
| | Huyện Cù Lao Dung | 144. Xã Đại An |
| | nt | 145. Xã An Thạnh |
| 18. Tỉnh Bạc Liêu | Huyện Đông Hải | 146. Xã An Phúc |
| 19. Tỉnh Tiền Giang | Huyện Gò Công Đông | 147. Xã Bình Xuân |
| 20. Tỉnh Cà Mau | Huyện Phú Tân | 148. Xã Tân Hải |
| 21. Tỉnh Bình Thuận | Huyện Tuy Phong | 149. Xã Hòa Phú |
| | nt | 150. Xã Liên Hương |
| | nt | 151. Xã Phan Rí Cửa |
| | nt | 152. Xã Vĩnh Tân |
| | nt | 153. Xã Phước Thế |
| | Huyện Hàm Tân | 154. Xã Sơn Mỹ |
| | Huyện Hàm Thuận Nam | 155. Xã Tân Thuận |
| | nt | 156. Xã Tân Thành |
| | Thành phố Phan Thiết | 157. Xã Tiến Thành |

Appendix b: Fisheries Sector Statistics

Table A-1 Marine fish landings ('000t)

| | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 |
|-----------------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|
| Total North | 34.5 | 37.0 | 42.2 | 44.9 | 45.9 | 57.3 | 63.3 | 71.5 | 79.6 | 90.3 | 95.1 |
| North Central | 78.2 | 86.6 | 86.8 | 71.3 | 95.4 | 104.0 | 115.6 | 124.0 | 124.3 | 141.2 | 156.4 |
| South Central | 250.6 | 261.4 | 288.8 | 289.3 | 336.8 | 335.8 | 350.6 | 361.1 | 391.3 | 401.5 | 411.0 |
| South | 426.4 | 497.1 | 533.2 | 551.6 | 596.6 | 650.5 | 680.3 | 720.9 | 799.0 | 770.7 | 805.7 |
| Provinces total | 789.8 | 882.1 | 950.9 | 957.0 | 1074.8 | 1147.6 | 1209.8 | 1277.5 | 1394.2 | 1403.7 | 1468.2 |
| Other | 8.3 | 7.9 | 3.8 | 4.0 | 3.9 | 3.8 | 3.0 | 3.1 | 1.5 | 2.5 | 2.0 |
| Total | 798.1 | 890.0 | 954.6 | 961.0 | 1078.6 | 1151.4 | 1212.8 | 1280.6 | 1395.8 | 1406.2 | 1470.2 |

Source: MOFi FICEN

Table A-2 National mechanized fishing fleet, 1991 to 2002

| Mechanized vessels | 1991 | 1992 | 1993 | 1994 | 1995 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 |
|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Number of vessels | | | | | | | | | | | |
| Northern | 2149 | 7229 | 7403 | 7155 | 7158 | 6326 | 7026 | 8974 | 9118 | 9127 | 10671 |
| North Central | 9358 | 11658 | 13567 | 14926 | 16129 | 16057 | 17630 | 16756 | 16959 | 16791 | 17390 |
| South Central | 18935 | 20864 | 23588 | 25289 | 26150 | 26039 | 26384 | 26243 | 25845 | 26208 | 26671 |
| Mekong | 13746 | 13807 | 15985 | 16421 | 18791 | 19986 | 20725 | 21557 | 21958 | 22331 | 21997 |
| Total | 44188 | 53558 | 60543 | 63791 | 68228 | 68408 | 71765 | 73530 | 73880 | 74457 | 76729 |
| State Enterprises | 159 | 148 | 108 | 68 | 68 | 44 | 36 | 32 | 38 | 38 | 44 |
| Total | 44347 | 53706 | 60651 | 63859 | 68296 | 68452 | 71801 | 73562 | 73918 | 74495 | 76773 |
| Total '000 hp | | | | | | | | | | | |
| Northern | 41 | 80 | 87 | 87 | 91 | 130 | 151 | 196 | 217 | 221 | 261 |
| North Central | 128 | 152 | 179 | 210 | 239 | 280 | 325 | 366 | 398 | 411 | 443 |
| South Central | 300 | 351 | 414 | 494 | 561 | 666 | 710 | 782 | 829 | 869 | 928 |
| Mekong | 279 | 364 | 487 | 706 | 786 | 1031 | 1226 | 1469 | 1797 | 1977 | 2052 |
| Total | 749 | 947 | 1166 | 1498 | 1678 | 2107 | 2413 | 2813 | 3241 | 3479 | 3683 |
| State Enterprises | 50 | 38 | 31 | 29 | 29 | 19 | 15 | 16 | 19 | 19 | 19 |
| Total | 799 | 985 | 1197 | 1527 | 1707 | 2126 | 2428 | 2829 | 3260 | 3497 | 3701 |
| Average hp/vessel | | | | | | | | | | | |
| Northern | 19 | 11 | 12 | 12 | 13 | 21 | 22 | 22 | 24 | 24 | 24 |
| North Central | 14 | 13 | 13 | 14 | 15 | 17 | 18 | 22 | 23 | 24 | 25 |
| South Central | 16 | 17 | 18 | 20 | 21 | 26 | 27 | 30 | 32 | 33 | 35 |
| Mekong | 20 | 26 | 30 | 43 | 42 | 52 | 59 | 68 | 82 | 89 | 93 |
| Total | 17 | 18 | 19 | 23 | 25 | 31 | 34 | 38 | 44 | 47 | 48 |
| State Enterprises | 314 | 258 | 285 | 424 | 424 | 422 | 412 | 498 | 498 | 498 | 422 |
| Total | 18 | 18 | 20 | 24 | 25 | 31 | 34 | 38 | 44 | 47 | 48 |

Source: MOFi Fisheries Informatics Division

Table A-3 Fisheries labor ('000)

| | 93 | 94 | 97 | 98 | 99 | 00 | 01 | 02 |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|
| South | 78.1 | 92.2 | 143.5 | 154.8 | 155.7 | 156.3 | 160.7 | 167.8 |
| S Central | 144.2 | 157.3 | 187.7 | 195.6 | 242.9 | 246.1 | 249.8 | 215.9 |
| N Central | 103.8 | 99.5 | 108.5 | 111.9 | 110.6 | 115.9 | 121.7 | 112.1 |
| North | 35.9 | 38.0 | 42.6 | 46.0 | 37.9 | 37.4 | 37.5 | 58.1 |
| SOEs | 2.2 | 2.2 | 1.7 | 1.8 | 1.9 | 1.9 | 1.9 | 1.9 |
| Total | 362.0 | 387.0 | 482.3 | 508.4 | 547.1 | 555.8 | 569.7 | 553.9 |

Source: FICEN

Table A-4 Estimated fish stocks and "allowable" catches

| | Fish stock | TAC |
|--|------------|-----|
|--|------------|-----|

(6)

| | | Depth | tons | % | tons | % |
|----------------|--------------------------------|-----------|-----------|-----------|---------|-----|
| Tonkin Gulf | Small pelagic | | 390,000 | 57 | 156,000 | 57 |
| | Demersal | < 50m | 39,200 | 6 | 15,700 | 6 |
| | Demersal | > 50m | 252,000 | 37 | 100,800 | 37 |
| | Total | | 681,200 | | 272,500 | |
| Central Region | Small pelagic | | 500,000 | 82 | 200,000 | 82 |
| | Demersal | < 50m | 18,500 | 3 | 7,400 | 3 |
| | Demersal | > 50m | 87,900 | 14 | 35,200 | 15 |
| | Total | | 606,400 | | 242,600 | |
| South Eastern | Small pelagic | | 524,000 | 25 | 209,600 | 25 |
| | Demersal | < 50m | 349,200 | 17 | 139,800 | 17 |
| | Demersal | > 50m | 1,202,700 | 58 | 481,100 | 58 |
| Total | | 2,075,900 | | 830,500 | | |
| South western | Small pelagic | | 316,000 | 62 | 126,000 | 62 |
| | Demersal < 50m | | 190,700 | 38 | 76,300 | 38 |
| Total | | 506,700 | | 202,300 | | |
| Floating knoll | Small pelagic | | 10,000 | 100 | 2,500 | 100 |
| Total sea area | Deep sea pelagic ^{a/} | | 300,000 | | 120,000 | |
| Total | Small pelagic | | 1,730,000 | 41 | 694,100 | 41 |
| | Demersal | < 50m | 597,600 | 14 | 239,200 | 14 |
| | Demersal | > 50m | 1,542,600 | 37 | 617,100 | 37 |
| | Deep sea pelagic ^{a/} | | 300,000 | 7 | 120,000 | 7 |
| Total | | 4,180,200 | 100 | 1,672,900 | 100 | |

a/ Data presumed according to total catch of the countries in this area.

Source: MOFi FISTENET http://www.fistenet.gov.vn/index_En.asp

Table A-5 Budget expenditure on fisheries by type by central and local government 1997-2002

| (Ð billion) | | | | | | | |
|--------------|--------------------------------|---------------------------------|---------------------------------------|----------------------------------|-------------------------------------|---|---|
| | Total State Expenditure | Capital Expenditure ** | Current Exp Total | Current Salaries & wages | Current exp O&M | State Expenditure: Central | State Expenditure: Local |
| 1997 | 103 | 60 | 42 | 8 | 33 | 42 | 60 |
| 1998 | 484 | 453 | 30 | 6 | 19 | 426 | 58 |
| 1999 | 275 | 230 | 46 | 8 | 31 | 181 | 94 |
| 2000 | 157 | 106 | 51 | 12 | 34 | 50 | 107 |
| 2001 | 376 | 300 | 76 | 15 | 52 | 102 | 274 |
| 2002 | 478 | 384 | 94 | 16 | 60 | 104 | 373 |
| Share | Share in total budget % | Share in total cap exp % | Share of total recurrent exp % | Share in total salaries % | Share in total O&M exp % | Share in sector's total public exp % | Share in sector's total public exp % |
| 1997 | 0.1 | 0.3 | 0.1 | 0.0 | 0.2 | 41.4 | 58.6 |
| 1998 | 0.7 | 1.9 | 0.1 | 0.0 | 0.1 | 88.1 | 11.9 |
| 1999 | 0.3 | 0.7 | 0.1 | 0.0 | 0.2 | 65.8 | 34.2 |
| 2000 | 0.2 | 0.3 | 0.1 | 0.0 | 0.1 | 32.0 | 68.0 |
| 2001 | 0.3 | 0.7 | 0.1 | 0.0 | 0.2 | 27.1 | 72.9 |
| 2002 | 0.4 | 0.7 | 0.1 | 0.0 | 0.3 | 21.9 | 78.1 |

exp = expenditure, O&M = operation and maintenance

* not including expenditure for social support, price subsidies, additional transfers to the lower levels, interest payment and other current expenditure.

** Including expenditure on major repairs

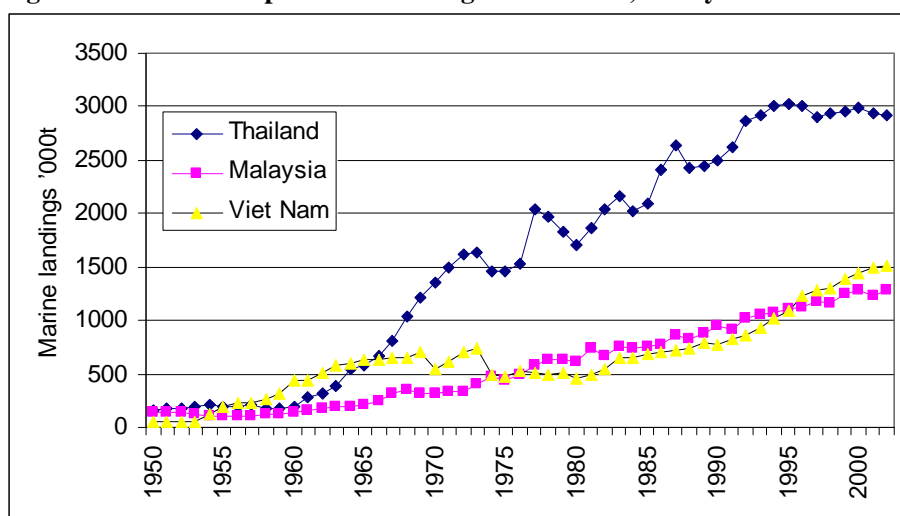
Source: Ministry of Finance, 2004

Table A-6 ODA to fishery sector, 1997-2002 (\$ million)

| | Total ODA Disbursed | Investment TA Projects | Other projects | % ODA in National Fisheries Budget | Portion of IPA & IPT in total ODA |
|-------|---------------------|------------------------|----------------|------------------------------------|-----------------------------------|
| 1997 | 12.05 | 7.69 | 4.36 | 182% | 64% |
| 1998 | 4.89 | 2.48 | 2.41 | 16% | 51% |
| 1999 | 6.46 | 3.80 | 2.66 | 37% | 59% |
| 2000 | 7.72 | 4.80 | 2.92 | 77% | 62% |
| 2001 | 7.78 | 6.32 | 1.45 | 32% | 81% |
| 2002 | 4.16 | 3.30 | 0.86 | 14% | 79% |
| Total | 43.05 | 28.38 | 14.66 | 36% | 66% |

ODA = official development assistance,

Source: UNDP Vietnam Development Cooperation, 2003.

Figure A-1 Marine capture fish landings in Thailand, Malaysia and Viet Nam

Source: FAO FishStat

Appendix c: Persons and Institutions Consulted

| | | Position | Department | Institution |
|-----|-----------------------|-------------------------|--|---------------------------|
| 1. | Dr Nguyễn Việt Thắng | Vice Minister | | MoFi |
| 2. | Mr Phạm Trọng Yên | Deputy director | International Cooperation Department | MoFi |
| 3. | Mr Dũng Tiến | Senior expert | Dept of Fisheries | MoFi |
| 4. | Mr Sơn | | Dept Finance & Accounting | MoFi |
| 5. | Dr Nam | Specialist | Dept of Sciences and Technology | MoFi |
| 6. | Mr Oai | Deputy head | Department for Fisheries Protection | MoFi |
| 7. | Ms Lan | Specialist | NAFIQAVET | MoFi |
| 8. | Mr Lâm | Deputy head | National Agriculture Extension Centre | MARD |
| 9. | Mr Chiêu | Head | International Cooperation Department | MARD |
| 10. | Mr Chuông | Senior expert | International Cooperation Department | MARD |
| 11. | Mr Đào Q Thu | Deputy head | Dept for Agriculture and Forestry | MPI |
| 12. | Mr Nguyễn Văn Tý | | Dept for Agriculture and Forestry | MPI |
| 13. | Mr Ngân | | Dept for Agriculture and Forestry | MPI |
| 14. | Mr Hoàng Việt Khang | Deputy Director General | Foreign Economic Relation Department | MPI |
| 15. | Ms Lê Minh Toàn | Expert | Department of Environment | MONRE |
| 16. | Mr Nguyễn Đức Hưng | Expert | Department of Environment | MONRE |
| 17. | Mr Phong | | | ADB |
| 18. | Mr David Brown | | WB Coastal Wetlands Project | |
| 19. | Mr Lars Joker | Chief Technical Adviser | STOFA -Strengthening of the Fisheries Administration | FSPS |
| 20. | Mr Karl Johan Staehr | Chief Technical Adviser | ALMRV | FSPS |
| 21. | Dr Nguyễn Long | Deputy Director | | RIMF |
| 22. | Mr Nguyễn Việt Nghĩa | Deputy head | Department for Marine Resource Research | RIMF |
| 23. | Mr Nguyễn Khắc Bát | Deputy head | Department for Marine Resource Research | RIMF |
| 24. | Mr Phan Huu Dung | Director | Saigon-Vietlong Fishery Company | |
| 25. | Mr Trương Trọng Nghĩa | Vice-Dean | College of Aquaculture and Fisheries | Can Tho University |
| 26. | Le Xuan Sinh | | Dept Fishing & Fisheries Resource Mgmt College of Aquaculture and Fisheries | Can Tho University |
| 27. | Dr Thái Thanh Dương | Director | | FICEN |
| 28. | Mr Dương Long Trì | Vice Director | | FICEN |
| 29. | Ms Phạm Tuyết Nhung | Vice Director | | FICEN |
| 30. | Dr Vũ Văn Xứng | Vice Rector | | University of Fisheries |
| 31. | Dr Hoàng Tùng | Rector's Assistant | | University of Fisheries |
| 32. | Dr Nguyễn Tác An | Director | | Institute of Oceanography |
| 33. | Dr Võ Sỹ Tuấn | Deputy director | | Institute of Oceanography |
| 34. | Mr Trung | Vice Director | | RIA2 |
| 35. | Mr Nguyễn Hưng Điền | Director | | RIA3 |
| 36. | Mr Bernard O'Callahan | Project Adviser | | Hòn Mun MPA Nha Trang |
| 37. | Mr Hồ Văn Trung Thu | Project Coordinator | | Hòn Mun MPA |
| 38. | Mr Trương Kinh | Director | Nha Trang Bay MPA Authority | Hòn Mun MPA |
| 39. | Đậu Văn Cường | Vice Director | DOFi | Hai Phong City |
| 40. | Nguyễn Thanh Ngọc | Director | Bắc Hải collective Corporation | Hai Phong City |
| 41. | Mr Đinh Khắc Nhún | Chairman | Lập Lễ Fishing Cooperative, Thủy Nguyên District | Hai Phong City |
| 42. | Mr Nguyễn Duy Hưng | Vice Chairman | People's Committee of Quảng Ninh | Quảng Ninh |

| | | | | |
|-----|----------------------|---------------------------|---|-----------------|
| | | | | prov |
| 43. | Mr Việt | | Aquaculture Enterprise | Quảng Ninh prov |
| 44. | Mr Cao Tuy | Deputy head | DOFi | Quảng Ninh prov |
| 45. | Mr Nguyễn Phi Hùng | Chairman | People Committee of Vân Đồn District | Quảng Ninh prov |
| 46. | Mr Mai Van Ninh | Vice Chairman | People's Committee Thanh Hoá Province | Thanh Hoá Prov |
| 47. | Mr Bao | Director | DOFI | Thanh Hoá Prov |
| 48. | Ms Sang | Vice Director | DARD | Thanh Hoá Prov |
| 49. | Mr Nam | Director | Dept of Science and Technology | Thanh Hoá Prov |
| 50. | Mr Dang Van Thong | Vice Director | Dept of Fisheries | Thanh Hoá Prov |
| 51. | Hanh | Chief of Agriculture Unit | People's Committee | Thanh Hoá Prov |
| 52. | Le Kha Cat | Deputy Administrator | People's Committee | Thanh Hoá Prov |
| 53. | Mr Trinh Ngoc Dong | Chief Unit | Dept of Planning and Investment | Thanh Hoá Prov |
| 54. | Mr Mai Xuan Xinh | Deputy Director | DOLISA | Thanh Hoá Prov |
| 55. | Mdm Nguyen Thi Ly | Deputy Head | Policy Unit of DOLISA | Thanh Hoá Prov |
| 56. | Mr Nguyen Xuyen Thuy | Vice Chairman | Ninh Hai commune, Tinh Gia district | Thanh Hoá Prov |
| 57. | Mr Le The Ky | Deputy | Social and Labour Unit | Thanh Hoá Prov |
| 58. | Mr Dau Van Lan | Chairman of Council | | Thanh Hoá Prov |
| 59. | Le Van Chat | Vice Chairman | People's Committee | Hà Tĩnh Prov |
| 60. | Bui Tung Phong | Director | Dept of Fisheries | Hà Tĩnh Prov |
| 61. | Le Duc Nhan | | Dept of Fisheries | Hà Tĩnh Prov |
| 62. | Nguyen Xuan Tinh | Director | Dept of Science and Technology | Hà Tĩnh Prov |
| 63. | Vo Ta Dinh | Vice Director | Dept of Resources and Environment | Hà Tĩnh Prov |
| 64. | Dung Viet Hung | Vice Director | Dept of Planning and Investment | Hà Tĩnh Prov |
| 65. | Phan Cao Thanh | Vice Director | Dept of Finance | Hà Tĩnh Prov |
| 66. | Nguyen Van Thanh | Vice Chief | People's Committee Office | Hà Tĩnh Prov |
| 67. | Dao Quang ??, | Vice Director | Dept of Social and Labour Dept | Hà Tĩnh Prov |
| 68. | Nguyen Ba Song | Vice Chairman | Ky Anh district | Hà Tĩnh Prov |
| 69. | Do Khoa Van | Vice Chairman | Thach Ha district | Hà Tĩnh Prov |
| 70. | Nguyen Duc Quang | Vice Chairman | Cam Xuyen district | Hà Tĩnh Prov |
| 71. | Tran Nghia | Team leader of Irrigation | Department of Agriculture and Rural Development | Hà Tĩnh Prov |
| 72. | Mr Phann Dinh Cong | Chairman | People's Committee Thach Bang village, Thach Ha District | Hà Tĩnh Prov |
| 73. | Le Duc Nien | Vice-Director | Xuan Pho fishing port | Hà Tĩnh Prov |
| 74. | Ho Thi Hang | Deputy Director | Nghe An Seaproduct Import-Export Joint Stock Company | |
| 75. | Mr Tach Sao | Villager | Vinh Rach Dong village | Bac Lieu Prov |
| 76. | Le Minh Chien | Vice Director | Department of Fisheries | Bac Lieu Prov |
| 77. | Huynh Quoc Khoi | Director | Fishery Extension Centre | Bac Lieu Prov |
| 78. | Mr Truc | | Dept of Fishery Management | Bac Lieu Prov |
| 79. | Mr Binh | shrimp farmer | Hoa Binh village | Bac Lieu Prov |
| 80. | Mr Bui Cong Chu | Chairman | People's Committee | Ca Mau prov |
| 81. | Mr Pham Van Duc | Director | DOFI | Ca Mau prov |
| 82. | Mr Ha | Vice Director | DOFI | Ca Mau prov |
| 83. | Mr Hoang Quoc Viet | Vice Director | DOFI | Ca Mau prov |
| 84. | Mr Le Van Quang | General director | MinhPhu seafood cooperation | Ca Mau prov |
| 85. | Mr Pham Thanh Ky | Vice director | Camau sea food processing import and export company (CAMIMEX) | Ca Mau prov |
| 86. | Mr Bui Chien | Director | Ca Mau Fishing port | Ca Mau prov |

| | | | | |
|------|---|---|---|-----------------|
| 87. | Mr Nguyen Van Nhiều, Mr Nguyen Thanh Ut Mr Bui Van Tam Mr Vo Van Kiep Mr Nguyen Van Be | Farmers | Luong The Tran commune, Cai Nuoc district | Ca Mau prov |
| 88. | Mrs Nguyen Ngoc Phuong | Vice Dir | Fisheries Department | Kien Giang |
| 89. | Mr Ho Van Chien | Vice Director | Extension Centre | Kien Giang |
| 90. | Mr Ngo Anh Kinh | Vice Dir | Sea food export and import company | Kien Giang |
| 91. | Mr Ngo Thanh Tam | Vice Dir | Training centre, DOLISA | Kien Giang |
| 92. | Mr Le Van Thieu | Specialist | DOFI | Kien Giang |
| 93. | Mr Nguyen Lam Son | Head | Administrative Depart, DOFI | Kien Giang |
| 94. | Mrs Vo Thi Van | Vice Director | DONRE | Kien Giang |
| 95. | Mrs Le Thi Nhut | Head | TECHNICAL DEPART, DOFI | Kien Giang |
| 96. | Mr Phung Van Thanh | Vice Dir | DOSTE | Kien Giang |
| 97. | Mr Tran Vinh | Deputy Head | Planing and investment Division, DOFI | Kien Giang |
| 98. | Mr Bui | Farmer | Phong To Chau village, Ha Tien | Kien Giang |
| 99. | Mr Ong Van Khan | Farmer | Ha Tien | Kien Giang |
| 100. | Ho Xuan Quang | Director | Kien Giang fishing port Management Company, Tac Cau Fishing port | Kien Giang |
| 101. | Nguyễn Thị Hoa | Deputy head | Aquaculture Division, DOFI of Khánh Hoà | Khanh Hoa prov |
| 102. | Mr Quách Thanh Sơn | Head | Division for Planning, DOFI of Khánh Hoà | Khanh Hoa prov |
| 103. | Ms Trần Mỹ Trang | Manager | Trading Department | Nha Trang Fisco |
| 104. | Ms Ngô Thị Thu Thanh | Accountant | | Nha Trang Fisco |
| 105. | Ms Hằng | Director assistant | | Nha Trang Fisco |
| 106. | Mr Lê Văn Tuấn | Deputy director | DOFI | Bình Thuận Prov |
| 107. | Mr Nguyễn Văn Chiến | Head Department for Economy and technology | DOFI | Bình Thuận prov |
| 108. | Mr Nguyễn Hoàng Thái Vinh | Head Division of Marine resource protection | DOFI of Bình Thuận | Bình Thuận prov |
| 109. | Mr Trần Hữu Đức | Specialist | DOFI of Bình Thuận | Bình Thuận prov |
| 110. | Mr Đỗ Văn Nam | Director Phan Thiet Fishing Port | | Bình Thuận prov |
| 111. | Mr Từ Nghi Lễ | Director | Export-Import Company of Bình Thuận | Bình Thuận prov |
| 112. | Ms Hồ Thị Xuân | Deputy director | The management board for fisheries infrastructure project of Bình Thuận | Bình Thuận prov |
| 113. | Mr Hồ Lâm | Deputy head | DONRE of Bình Thuận | Bình Thuận prov |
| 114. | Mr Nguyễn Văn Chót | Specialist | DOSTE of Bình Thuận | Bình Thuận prov |
| 115. | Mr Nguyễn Thành Hưng | Head Division of Planning | DARD of Bình Thuận | Bình Thuận prov |
| 116. | Mr Lê Dương Xương Huân | Deputy head of Division of Economy | DPI of Binh Thuan | Bình Thuận prov |
| 117. | Mr Trương Minh Chánh | Vice chair | PPC of Sóc Trăng | Sóc Trăng prov |
| 118. | Mr Phạm Minh Tiên | Director | DoFi of Sóc Trăng | Sóc Trăng prov |
| 119. | Mr Trần Anh Xuân | Vice Director | DOLISA of Sóc Trăng | Sóc Trăng prov |
| 120. | Mr Phạm Văn Đăng | Vice Director | DONRE of Sóc Trăng | Sóc Trăng prov |
| 121. | Mr Huỳnh Văn Được | Vice Director | DOSTE of Sóc Trăng | Sóc Trăng prov |
| 122. | Mr Mai Phước Hưng | Vice Director | DPI of Sóc Trăng | Sóc Trăng prov |
| 123. | Mr Nguyễn Đại Lượng | Director | Trần Đề Fishing Port | Sóc Trăng prov |
| 124. | Mr Tiêu Cẩm Châu | General Manager | Ut Xi Aquaproducts Processing Company | Sóc Trăng prov |
| 125. | Mr Craig Perry | Country Manager | Phillips Seafood (Vietnam) Co Ltd | Nha Trang |

Appendix d: Fisheries Law and Policy Framework

Fisheries Law

The fisheries law that became effective in July 2004 contains 62 articles, summarized below:

- 1: Application of the Law
- 2: Explanation of terms
- 3: Property over fisheries resources
Fisheries resources shall be subject to the ownership of the people and under the integrated management of the State.
- 4: Principles in fisheries activities
Promotes economic effectiveness in accordance with the protection, rehabilitation and development of fisheries resources and biodiversity and protection of the environment. Development in accordance with national and provincial master plans. Prevent, avoid or mitigate adverse impacts caused by natural disaster and fish diseases; promote the safety of humans, fishing vessels and facilities
- 5: Sustainable fisheries development
Subject to master plan
- 6: Prohibited activities in fisheries activities
Subject to master plan
- 7: Habitat protection
- 8: Conservation, protection, rehabilitation and development of fisheries resources
Including fishing methods, types of fishery and fishing gear which are prohibited to be used or are restricted to be used; species, size and seasonal limits and the issue by provinces of necessary supporting regulations
- 9: Planning and management of inland protected areas and marine parks
- 10: Financial sources for rehabilitation of fisheries resources
- 11: Principles in fishing operations including issues of sustainability, seasonal, gear, species and size limitations
- 12: Offshore fishing
- 13: Coastal fishing
- 14: Survey and research of fisheries resources
- 15: Management of fishing grounds
- 16: Fishing license
- 17: Conditions for granting fishing license
- 18: Withdrawal of fishing license
- 19: Fishing report and logbook
- 20: Rights of organizations and individuals engaged in fishing operations
- 21: Obligations of organizations and individual engaged in fishing operations
- 22: Prevention, control and mitigation of adverse impacts caused by natural disaster during fishing operations
- 23: Master plan on aquaculture development
- 24: Aquaculture conditions
- 25: Rights of organizations and individuals engaged in aquaculture
- 26: Obligations of organizations and individuals engaged in aquaculture
- 27: Allocation, lease and revocation of aquaculture land
- 28: Allocation and lease of marine areas for aquaculture
Subject to master plan
- 29: Withdrawal of marine areas allocated and leased for aquaculture purposes
- 30: Rights of organizations and individuals to whom the marine areas are allocated and leased for aquaculture
- 31: Obligations of organizations and individuals using marine areas for aquaculture
- 32: Concentrated aquaculture areas
- 33: Fish fry

- Quality, trade, new species, monitoring
- 34: Import and export of fish fry
 - 35: Aquaculture feed; drugs and chemicals used in aquaculture
 - 36: Prevention and control of fish disease
 - 37: Development of fishing vessels
Subject to master plan, promotion of offshore vessels; vessel import
 - 38: Building and upgrade of fishing vessels
 - 39: Inspection of fishing vessel
 - 40: Registration of fishing vessel and its crew members
 - 41: Fishing ports, fish landing sites, storm-resistant places of fishing vessels
Subject to master plan
 - 42: Fish wholesale market
Subject to master plan, support for investment, management systems and technical standards
 - 43: Processing of fish and fishery products
Plant development in accordance with master plan, standards, staffing, product quality
 - 44: Preservation of fish materials and products
 - 45: Fish quality, hygiene and safety
 - 46: Import and export of fish and fishery products
 - 47: Principles in international cooperation on fisheries activities
 - 48: Development of international cooperation on fisheries activities
 - 49: Fishing in sea waters beyond the jurisdiction of Vietnam
 - 50: Foreign fishing in Vietnam sea waters
 - 51: Content of State management of fisheries activities
 - 52: State management duties on fisheries activities
 - 53: Fisheries inspection force
 - 54: Duties of fisheries inspection force
 - 55: Competence of fisheries inspection force
 - 56: Duties of organizations and individuals during fisheries inspection activities
 - 57: Rewards [in relation to contribution to the enforcement of this Law]
 - 58: Sanction
 - 59: Complaints and denunciation
 - 60: Transitional provisions
 - 61: Entry into force [The Law came into force from July 1st 2004]
 - 62: Executive guidelines

Policy Framework

(a) Marine Capture Fisheries

In 1997, under Decision 274 TTg of April 1997, established a committee to develop policy for offshore fishing. This was supported by Decision 393 covering construction and financing of offshore vessels. The decision was considered urgent and was introduced without feasibility study. Other problems related to allocation of benefits under the scheme and lack of transparency and inflexibility. SoEs were not required to provide any collateral. Households were required to provide 15% collateral, but were permitted to use the boat itself as collateral. A financed vessel could also be used as collateral for a second or other vessel. No new boats have been financed since 2001.

Decree 48CP of August 1996 and 91CP of August 1997 banned illegal fishing methods and promoted resource protection. All types of fishing vessels were required to be registered. Ordinance 1/1998/CT-TTg strictly forbade dynamite, poison and electric fishing.

Circular 600/TTL between MOFI and Ministry of Transport defined the measures required fishing vessel security (e.g., life jackets and flares).

Decision 358TTg of May 1997 defined the priority to be given to offshore fishing and established a five-year tax holiday for all offshore vessels (e.g., the 3% natural resources tax).

Responsibility for management of inland waters was passed to communities or individuals under Decision 100 of (about) 1999.

- A range of decisions between 1997 and 2001 established fisheries departments in all coastal provinces.

(b) Aquaculture

Decision No. 224/TTg “Aquaculture development 1999-2010”, approved by the Prime Minister in December 1999, that supports the expansion of aquaculture production, and laid a foundation for further government investments in the sectors development.

Resolution 09/2000/NQ-CP issued by the government in June 2000 on policies for economic transition and consumption of agro products. Together with Decision 224, this has stimulated rapid development of the aquaculture sector.

Decision 103/2000/QD-TTg dated from August 2000 encouraged the development of fish seed.

Decision 173/2001/QD-TTg of November 2001 focused on the socio-economic development of the Mekong Delta, and through allowing conversion of agriculture land, stimulated major expansion of shrimp in rice farming areas.

Decision 112 “Fish Seed Program”, June 2004 which complements the 224 Decision with a focus on fish, shrimp and mollusk seed for the aquaculture sector’s development.

The Law on Environmental Protection that provides a basis for EIA, and supporting guidelines that include reference to EIA for aquaculture projects and aquaculture plans.

The Decree on the conservation and development of wetlands approved in September 2003.

- Policies concerning Land Administration included the 2004 revised Land Law that influences the allocation and use of land for aquaculture.

(c) Processing and Export

Decision 13 of January 1997 defined the need to register certain types of production, which were required to be quality controlled (relating to most products apart from dried products, fish meal and fresh fish sold through markets)

Decision 18 of April 1998 banned the introduction of contaminants to increase sale weight (e.g., of shrimp)

Decision 178 of September 1998 supported the provision of export credits to processors

Decision 251 of December 1998 approved the fisheries processing and export development program to 2005

Decision 425 of May 2001 defined quality standards for fisheries commodities

Decision 251/1998/QĐ-TTg, of December 1998, on approval of a program on Development of Fisheries Exports to the year 2005

Appendix e: Marine Protected Areas – Current Status

As a way of preserving biodiversity of fish, corals and other organisms, a series of 15 marine protected areas have been proposed, within a national MPA network managed by the Ministry of Fisheries. Three of the 15 sites have already been funded and are under implementation, Hon Mun (Khanh Hoa Province commencing in 2000 under WB/Danida/IUCN financing, Cu Lao Cham (from 2003 as part of a DANIDA funded project) and Con Dao (commencing this year with support from UNDP/GEF/WWF).

The 15 proposed MPAs are as follows:

| <i>Location</i> | <i>Deepest (m)</i> | <i>Type/ category</i> | <i>Province/ city</i> | <i>Remarks</i> |
|---|--------------------|----------------------------|-----------------------|---|
| <i>The Gulf of Tonkin</i> | | | | |
| 1. Tran island | 10 | Unidentified | Quang Ninh | Frontier island, lack of information & data |
| 2. Co To island | 20 | MPA | Quang Ninh | An island district, not specifically zoned |
| 3. Cat Ba island | 35 | MP | Hai Phong | An island based NP was established by the Govt's decision (1986) with 540 ha of sea waters (the East Sea) |
| 4. Bach Long Vi island | 30 | Marine nature reserve | Hai Phong | Frontier island district, with the highest coral coverage & larger reefs |
| 5. Me Isle | 20 | MPA | Thanh Hoa | A broader coral range, but higher-level threats. 11 new species of fish discovered for VN. |
| 6. Con Co island | 20 | MPA | Quang Tri | Intact coral reef with high level diversity, located within the base line |
| 7. Hai Van- Son Tra island | 30 | MPA & Fishery Cons. | Thua Thien-Hue | Including Son Tra isle, northern Hai Van & Lang Co lagoon, highest diversity of habitats |
| <i>Central coastal seas</i> | | | | |
| 8. Cu Lao Cham | 30 | MPA | Quang Nam | Intact coral reef with unique structures, diversity of coral fish & valuable genetic resources |
| 9. Ly Son island | Unknown | MP | Quang Ngai | Coral reef developed on a volcano, multiple valuable & rare species |
| 10. Hon Mun-Bich Lam | 30 | MP | Khanh Hoa | Highest diversity of coral biome, most abundance of coral ichthyofauna, many rare & valuable species |
| 11. Hon Cau-Vinh Hao | 27 | Habitat/Species Cons. area | Binh Thuan | Intact coral reef, high biodiversity, many rare & valuable species, breeding grounds of fishes and sea turtles |
| 12. Phu Qui island | 42 | Unidentified | Binh Thuan | Diverse fisheries resources, and highest harvesting yield in VN, a logistic base for fishery & eco-tourism sectors |
| <i>East Southern coastal seas</i> | | | | |
| 13. Con Dao | 50 | MP | Ba Ria-Vung Tau | High biodiversity, characteristic coral reef, 60 rare species listed in Red Data Book of VN, a NP since 1993, with 9000 ha of sea waters. Regional level PA recognized internationally. |
| <i>West Southern coastal seas</i> | | | | |
| 14. Phu Quoc | 10 | MP | Kien Giang | Including An Thoi island cluster, high biodiversity, hawksbill turtle and dugon occur, multiple frontier islands |
| <i>Off-shore Paracel and Spratly seas</i> | | | | |
| 15. Spratly | 3000 | Marine nature reserve | Khanh Hoa | International level biodiversity center, coral islands, sovereign right in being disputed. |

MP = marine park, MPA = marine protected area

Hon Mun, was the first MPA to be established through a 4 year, \$2 million project co-funded by Global Environmental Facility (GEF), Danish International Development Agency (Danida), IUCN and the government. The project aims at protecting important examples of Vietnam's best remaining coral reef, mangrove and seagrass ecosystems, and at the same time enabling local island communities to improve their livelihoods and, in partnership with other stakeholders, effectively protecting and sustainably managing the marine biodiversity at Hon Mun as a model for collaborative MPA management in Vietnam. The GEF project document (http://www.gefweb.org/COUNCIL/GEF_C14/vietnam/viethon.pdf) indicates that:

"Fishing is a major activity in the area with about 15,000 fishermen based in the vicinity of Nha Trang city. Most of these are employed on large (10 to 20m) boats that trawl in offshore waters and fish for squid by night. Inshore bottom trawling is also common. One hundred fifty Nha Trang-based fishermen gain their livelihood from licensed standing nets in the project site, mainly catching passing pelagic species such as tuna and Pacific mackerel.

The islands in the proposed project site contain a population of approximately 5,300 people with 95% gaining their main income from fishing activities. These island communities are home to many of the poorest fisher families, who work with small boats that are limited to shallow and sheltered waters. These poorest fishermen, numbering about 300, mostly subsist on a decreasing catch supplying the local and international ornamental fish trade and from declining shellfish and oyster beds. They are responsible for a large proportion of the unsustainable fishing activity near Hon Mun (e.g., use of cyanide and explosives, coral and shellfish collection) and as such are a priority concern for this project. None of the island communities benefit from tourism activities - which are dominated by mainlanders - and only a few gain any income from rudimentary mariculture activities such as growing wild caught juvenile fish and lobster."

To date Hon Mun has served well as a pilot project for the Support to the MPA Network Project being financed by Danida (2003-2006). Discussion with Hon Mun MPA project management indicates that the project also has the potential to provide substantial benefits to communities, but that MPA development is difficult and complex, particularly in an area close to a major town (Nha Trang with a population of around 300,000) that has been heavily exploited for many years.

Con Dao has recently been accepted for funding under UNDP/WB/GEF. It has substantial potential for both biodiversity conservation and for tourism. The main risk is from the fishing port developed on the island, which the provincial government believes has substantial potential for development as a major international port and typhoon shelter. A recent PCR of the Fisheries Infrastructure Improvement Project recommended no further development of the port or fisheries infrastructure without the conduct of a full EIA. Con Dao is both a National Park and an MPA. It is a major site for nesting green turtles and also has a significant dugong population. The national park has operated a successful turtle conservation project supported by WWF since 1994.

Cu Lau Cham MPA implementation commenced in October 2003, aiming mainly at biodiversity conservation, tourism and sustainable livelihood development for the 3,000 residents of this island group.

It is expected that support to the MPA network will continue to be provided by Danida under a new environmental sector program proposed for 2005-2010. Under this program, Danida will continue to support Vietnam's policy and legal framework for MPAs, and capacity development for MPA management, but GoV and other donors will be expected to support the remaining undeveloped MPAs.

Appendix f: Fisheries Sector and ICZM Projects

1. Fisheries Sector Projects

Since November 1998 NORAD has sponsored an eight-year project through 2006 on building advanced research and education capacity for RIA No.1 (\$500,000 a year). The project is technology and poverty focused on different aspects of development including genetic selection, health management of aquatic animals and farming technologies, including seed production of some marine species. In addition, that project supports MSc education in aquaculture.

The DANIDA-funded 5-year Fisheries Sector Support (SPS) Program, implemented by MOFi, is the major current donor-funded intervention in the sector. The program is due to end in 2004 and is expected to be followed by a further 5-year phase. Two components are targeting freshwater and marine aquaculture, focusing on support to planning, technology development, extension, community pilots, disease control, training and administrative support in selected provinces. In the marine fisheries sub-sector, the program supports the Assessment of the Living Marine Resources of Viet Nam. Phase II of this component has focused on: (i) providing a reliable information base to monitor and assess the nation's fisheries; (ii) increasing the advisory capacity of MOFi and RIMF; and (iii) biological, economic and social research sub-components to evaluate and monitor the fisheries, oriented towards research of relevance for fishery management. A fourth component, the Seafood Export and Quality Improvement Program – SEAQIP, with * objectives relating to (i) developing VASEP, (ii) improving environmental management procedures and occupational safety; (iii) improving procedures and building capacity in NAFIQAVET; (iv) training programs for processors; and (v) monitoring quality standards at all stages in selected areas.

World Bank/DANIDA Coastal Wetlands Project covers reforestation of coastal mangroves in three provinces Bac Lieu, Ben Tre, Tra Vinh. A component of the project focuses on aquaculture for sustainable livelihoods of the poor.

The Mekong River Commission completed a project on rural extension in Mekong delta with focus on aquaculture in 2001. This is a sub-regional project covering three counties Vietnam, Cambodia, and Thailand. The project is implemented by RIA-2 in Mekong delta with the purpose to expand aquaculture activities in Tien Giang province. Research on aquaculture of indigenous Mekong species and management of the reservoirs of the central plateau are also being supported.

ACIAR is funding several research projects in Vietnam, including a research project on development of reservoir fisheries through introduction of cage technology for nursing fingerlings in two provinces Thai Nguyen and Yen Bai. The project is in the last stage with some on-farm trials being conducted. ACIAR is also funding other research project on increase of fish production in integrated system through optimal application of manure in ponds, and shrimp farming in the Mekong delta through Can Tho University.

SIDA and DANIDA through AIT are funding RIA-1 to implement research on development of small-scale aquaculture and education in Vietnam. These funds are used by several institutions such as RIA-1; University of Fisheries, Nha Trang; University of Agriculture and Forestry, Ho Chi Minh City; Vocation School No 4, Bac Ninh for implementation of the research and education activities in the selected areas with focus on poverty alleviation.

UNDP has supported several projects targeting poverty alleviation through aquaculture, including a mountain aquaculture project (VIE/98/009) and one related to livelihood development of coastal communities through aquaculture and better management of coastal environment. Experiences from UNDP projects have been instrumental in convincing government and donors of the potential of aquaculture for poverty alleviation in Vietnam. A continued close partnership among UNDP and the MOFi is important and encouraged.

Environmental Management of Coastal Aquaculture (UNDP/DANIDA 2003)

VIE/97/030

Project is designed to support improvements in planning, and local management, of coastal aquaculture in three coastal provinces in north-central Vietnam. In support of the project, an STS mission was organized to provide additional inputs on aquaculture planning. Objectives include: (i) Review of existing coastal aquaculture plans and environmental management guidelines in the project areas and assess the potential environmental consequences; (ii) Assessment of degree to which environmental considerations and guidelines are taken into account in current coastal aquaculture development plans to avoid possible environmental consequences of implementing such plans; (iii) Preparation of a proposal to support the project to carry out coastal aquaculture plans in some pilot districts or communes for demonstration of methodology for aquaculture planning at the district/commune level; (iv) development of practical guidelines for aquaculture planning with a semi-official/legal framework that can be adopted and implemented at the local level to support community-based environmental management systems; and (v) comment on coastal aquaculture planning and policies to benefit the poor for the UNDP/FAO Discussion Paper on aquaculture and poverty.

ICZM Related Projects⁹

VNICZM (Dutch Government 2000-2003)

Vietnam-Netherlands Integrated Coastal Zone Management Project (VNICZM)

Sponsor: Royal Netherlands Embassy

Executing Agency: MONRE/VEPA (former MOSTE/NEA)

Beneficiaries: MONRE; Nam Dinh; Thua Thien Hue; Ba Ria - Vung Tau

Contractor: NEDECO (Netherlands Consulting Engineers) through a VNICZM office in Hanoi and Nam Dinh, Thua Thien Hue and Ba Ria - Vung Tau Pilot Project offices

Theme: Coastal zone management

Location: Nam Dinh; Thua Thien Hue; Ba Ria - Vung Tau

Objectives:

1. ICZM awareness raising with Authorities, Stakeholders and Users of a Sustainable Development of the Vietnamese Coastal Zones;
2. Strengthen capacity of MONRE's VEPA (Vietnam Environmental Protection Agency), (previously MOSTE - National Environment Agency), and provincial departments (DONREs)
3. Assess needs and functions of a Coastal Zone Management Center;
4. Develop ICZM Strategies and Action Plans at provincial level;
5. Win - Win for Dutch and Vietnamese Integrated Coastal Zone Management Approach;
6. Improve Living Conditions Coastal Communities

Type: TA Grant

Summary: The Vietnam Netherlands Integrated Coastal Zone Management Project is a 3-year project (Sept. 2000- Aug. 2003) is aiming at establishing a longer term "Vietnam ICZM Program" and focused on the goal of advising the Vietnamese Government in the planning and development of the Vietnamese coastal zone, its communities and its resources in a sustainable way. The project is coordinated by MONRE via its Vietnam Environmental Protection Agency. Technical assistance is provided through NEDECO, a Dutch consortium of engineering consultants.

NEDECO and MONRE are implementing the project with participation from various national relevant ministries and agencies as well as Provincial People's Committees and Vietnamese consultants.

⁹ Data from ADB (2003) based on Viet Nam Netherlands Integrated Coastal Zone Management project records

The Vietnam ICZM Program employs a Strategy and Action Plan for ICZM as the main tool to bring about the transition from the project to the long-term program. The SAPICZM, will provide the forum for interaction between ministries and provincial authorities via workshops, seminars, scientific meetings and consultative sessions.

A central project office is located in Hanoi and three provincial focal points have been established via Pilot Projects at Nam Dinh (Red River Delta, North Coast), Thua Thien Hue (Central Coast) and Ba Ria - Vung Tau (South Coast). The project builds on the relationships established during baseline vulnerability assessment and preparatory studies, which have been conducted as a lead-up to this project between 1994-1996.

A reference center is being set-up, which information is being linked to the VNICZM Project website (www.nea.gov.vn/projects/vniczm.htm).

Training is given in ICZM principles and tools, in Vietnam (Hanoi and in the pilot provinces), in Manila and in The Netherlands.

Start Date: 1 September 2000 Completion date: 31 August 2003

A second phase was approved in principle, as announced by the Dutch Vice-ambassador on 7 May 2003.

VNICZM is supported by two projects - CCP2002 and CCP2003, financed by the Dutch Ministry of Transport, Public Works and Water Management in association with the Royal Netherlands Embassy. They support VNICZM by providing specific technical advice on among other issues: monitoring programs, awareness raising among schoolchildren, remote sensing. The ultimate objective is to reach a long-term commitment between MONRE and the Dutch MT, PW & WM (2004-2008) on technical cooperation in the field of ICZM, not necessarily limited to Thua Thien Hue Province. The MOU should be signed in late 2003. Linkage with the ADB PPTA, through the ICZM Division of VEPA, will be essential.

ICM Program Development & Implementation in Da Nang (PEMSEA/IMO 2000-04)

National Demonstration Site for Integrated Coastal Management at Da Nang

Sponsor: PEMSEA

Executing Agency: PEMSEA

Beneficiaries: DOSTE Da Nang, PPC Da Nang

Theme: ICM

Location: Da Nang

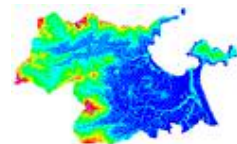
Objectives:

Workshop on Integrated Coastal Management. PEMSEA's project design is based on two management frameworks, namely: ICM and risk assessment/ risk management. Demonstration sites will be set up throughout the region to implement these two mechanisms.

Type: grant

Start date: 2000 **Completion date:** 2004

The National ICM (Integrated Coastal Management) Demonstration Site Project in Da Nang has been set up under the GEF/UNDP/IMO/Regional Program on the Partnership for Environmental Management in the East Asian Seas.



At the central level, MOSTE is coordinating the project through NEA. At the local level, the project is managed by the People's Committee of the City. Da Nang DOSTE is the leading implementing agency.

The core project area, on the land part, covers five coastal districts of Da Nang including Hai Chau, Thanh Khe, Lien Chieu, Son Tra and Ngu Hanh Son and on the marine part, the Da Nang Bay and the coastal water of Son Tra and Ngu Hanh Son districts up to 20m depth approximately.

The major objectives of the project are to develop the local capacity for Da Nang City in coastal resources and environment in a sustainable way by using the ICM methodology and approaches, and demonstrate the results of the project to other coastal zones of Vietnam and the East Asian Seas region.

Building Capacity for Integrated Coastal Management (NOAA 2003-)

Building capacity for integrated coastal management in the Tonkin Gulf in Quang Ninh Province

Implementing Institutions: National Oceanic and Atmospheric Administration (NOAA)

Brief Activity Description: The Vietnamese government is making a concerted effort to develop an integrated coastal management region as it undergoes political and economic reform aimed at economic development. As the country seeks to build societal capacity to design and implement effective sustainable coastal development practices and policies and promote economic development, it must preserve biological productivity of the coastal and marine environment while developing poverty reducing opportunities for its people.

This proposal develops local and regional institutional, community, and technological capacity for coastal and marine resource management in the Gulf of Tonkin Archipelago as a valuable anchor in support of Vietnam's national development policy goals. The project will allow Vietnam to access the experience, knowledge, technical expertise, and technology of the United States in marine protected area (MPA) management in partnership with international, governmental and nongovernmental organizations. It creates a demonstration site of coastal management excellence in Vietnam based upon national goals, regional planning, and local management needs. At the completion of the two year work plan, Vietnam will have institutionalized consultative and multi-sectoral planning and management mechanisms with proven results, incorporating tools such as GIS, marine boundary zoning systems, environmental and sociological monitoring and assessment systems, community education and outreach campaigns all of which are important elements in effective integrated coastal management programs.

Resources will be leveraged with funding and in-kind contributions from the National Oceanic and Atmospheric Administration, the Global Environmental Facility, the IUCN-World Conservation Union, Reef Check and others to introduce conceptual frameworks for integrated coastal management, develop Vietnamese language curricula and educational material for broad government and non-government audiences, and transfer and deploy technologies to support management to improve marine and coastal management in an important part of Asia. Following this program, Vietnam will have a stronger capacity to define issues and solutions, collect information to monitor and evaluate environmental change, and develop effective, timely management responses over time.

Rural Development Programs in Quang Tri & TT Hue (FINIDA & NORAD 1999-2005)

FINIDA Thua Thien Hue and Quang Tri

Funded by: Finish Government

(d) Thua Thien Hue

Project started in Nov 1999 as a pilot project in one district (Phang Dien) and the first phase ends in November 2003. Funded by a US\$4.00 million grant from Finland with a matching Vietnam Government contribution of 14%, mostly for administration and infrastructure. The local communities are also required to contribute a minimum of 10% for local infrastructure projects

The objective is Poverty Reduction and Empowerment and to establish conditions for economic development. The project concentrates on one district Phang Dien 35 km north of Hue on the northern border on the province.

Project components

1. Institutional development
 - a. Capacity building
 - b. Exchange of experiences
 - c. Community participation
2. Rural Income Expansion
 - a. Crop husbandry
 - b. Livestock
 - c. Aquaculture
 - d. Non-farm activities
3. Infrastructure
4. Environment protection

Quang Tri and Thua Thien Hue Rural Development Programs

The credit & saving project (microfinance project) is piloting in one commune (in the whole of Viet Nam) - Vinh Tu commune, Vinh Linh district, Quang Tri province working through the Commune Women's Union. At present, there are 145 borrowers in 28 sub-groups. This will increase to around 300 women in 3 target communes in Quang Tri province over the next 3 months. The credit limit is Đ3 million per household. Term is one year, only management fees are charged, not interest.

At the International level, Plan has a technical team for microfinance and this team is organized meeting annually. Last year, the meeting was in Dacca, Bangladesh.

In Hue province, Plan International supports infrastructure and livelihoods development, but does not provide credit. The first phase is in Hai Lang district (south coastal) 1997-2005 and expanded to Cam Lo and Da Krong (mountain) in the second stage 2000-2005. Focus is on: (i) construction of infrastructure, particularly irrigation, schools and rural roads and (ii) income generation for the rural poor (business development, training and credit revolving funds administered by Women's Union). Using local contractors and village/commune labor. PRA is conducted by PMU to define infrastructure needs.

NORAD - Quang Tri Rural Development Program covering 7 coastal communes in Trieu Phong district. Similar to the FINIDA above

Community Based Rural Infrastructure Project (World Bank 2001-2007)

Total cost: US\$123.41 million, World Bank credit: US\$102.78 million

Duration: 2001-2007

Implementing agency: Ministry of Planning and Investment, Department of Local and Regional Planning

Project objective: To reduce rural poverty in the poorest communes in thirteen provinces of central Vietnam by: a) increasing the capacity of these communes for decentralized and participatory planning and management of development activities; b) providing essential small-scale public infrastructure;

and c) generating direct income for the poor through construction employment. The issue of grants to communes is decided by the communes themselves.

Project provinces and (number of poor communes): Thanh Hoa (57), Nghe An (101), Ha Tinh (49), Thua Thien Hue (32), Quang Nam (72), Quang Ngai (82), Binh Dinh (21), Phu Yen (15), Khanh Hoa (33), Binh Phuoc (24), Lam Dong (923), Ninh Thuan (16), Binh Thuan (15). 540 poor communes are initially targeted. This number could be increased following the project's early mid-term review scheduled for December 2003.

Eligible commune infrastructure: transport infrastructure (improvement to existing roads, tracks and trails, bridges, ferry crossing points); drinking water systems; small irrigation schemes; public buildings (schools, health stations, communal houses, sanitation facilities, markets); flood protection works; and, electric power.

Eligible inter-commune works: improvements to existing transport infrastructure; improvements to existing irrigation or flood control schemes; and, extension of the electricity grid.

Central Region Water Resources Sector (ADB 2003)

PPTA: VIE30292-02

Location: Central Region of Vietnam

Sector: Agriculture and Natural Resources /Irrigation and Rural Development

Executing Agency: Ministry of Agriculture and Rural Development (MARD)

Description

The central region of Vietnam currently suffers from water shortages and saltwater intrusion during the dry season, flooding in the wet season, and is frequently hit by natural disasters, which is a constraint to economic growth. Much of the existing water resources infrastructure in the region is performing below its potential and requires upgrading. The Government has placed high priority on development of water resources infrastructure in the region to expand irrigation and flood control systems and to mitigate the effects of natural disasters. The proposed Project will develop new and existing infrastructure to provide more reliable water supplies in the rural areas, improve flood control and management, and increase agriculture production.

Objectives and Scope

The TA will prepare a sector project to improve existing and develop new water resources systems, and promote improved management practices to ensure they will increase and protect incomes and livelihoods of people in the poorest provinces in central region of Vietnam. The specific objectives of the TA are to assist MARD to (i) build further capacity to prepare a comprehensive investment strategy for optimizing investments in the water resources sector - Part A, and (ii) to prepare an investment project for water resources development and management for about six selected provinces in the central region of Vietnam - Part B. Preparation of the project will take into account the results of TA 3528, Subproject 2, which analyzed and ranked potential water resources investments in the central region according to their poverty, environmental, and economic impact. Part A will further develop this work to provide the basis for selection of subprojects for the project, including the selection of at least five core subprojects that will be studied to feasibility level under Part B. The scope of the proposed project will be limited to two main sub-sectors: irrigation and drainage, and flood control and protection, with emphasis on contributing to long-term mitigation of natural disasters in the region.

Benefits and Beneficiaries

The project is expected to provide increased security against natural disasters for both urban and rural communities. It will also increase agricultural output in poor rural areas of the central region, resulting in increased farmer incomes and localized economic growth.

Central Region Livelihood Improvement Project (ADB 2003-07)

Objectives and Scope: The Project is intended to help the Government ensure that the poor in upland communes of Kon Tum, Quang Binh, Quang Tri and Thua Thien Hue achieve sustainable livelihoods with an improving quality of life resulting in a reduction in the incidence of poverty in the project area. A critical feature of the proposed Project is its focus on developing innovative natural resource management strategies linked to social development objectives. These objectives will be achieved through (i) improving and sustaining household food security; (ii) generating of incremental household income through improved on-farm productivity, infrastructure development, and off-farm income generating opportunities; (iii) developing community capacity to utilize and manage scarce resources to achieve equitable and sustainable socioeconomic development through planning and implementation of an expanded social development plan; (iv) strengthening the capacity of support services to respond to grassroots initiatives so that they can deliver improved services in upland communities; and (v) providing technical and financial support for the efficient implementation of the project. Approximately 65,000 households comprising about 348,000 people are expected to benefit from the project through increases in incremental household incomes due to increased agricultural production, improved rural infrastructure, and use of improved technology for on- and off-farm production activities

Cost Estimates: \$76.0 million equivalent

Implementation Arrangements: A project management unit (PMU) will be established in each provincial department of planning and investment (DPI) and, will be responsible for overall management of the project. Each PMU will be staffed with a project director and support staff. A team of international and domestic consultants will provide advisory support to each PMU to ensure effective implementation of the project. Various local government and quasi-governmental agencies will provide technical support under the project. The district-based Department of Agriculture and Rural Development will assist with implementation of the household food security and income generation components by supporting farmer-managed demonstrations to improve agricultural production, and by providing engineering design support for irrigation construction and upgrading. The Viet Nam women's union will assist in implementation of the household food security component and the microfinance services subproject-component. The district-based Department of Transport will provide engineering design support for rural road construction and improvement. Nongovernment organizations (NGOs) and local training institutions will support implementation of the community development and institutional strengthening components under the project.

Executing Agencies The provincial people's committees of Kon Tum, Quang Binh, Quang Tri and Thua Thien Hue, and the Viet Nam Bank for Agriculture and Rural Development.

Procurement: Civil works, materials, and equipment will be procured in accordance with ADB's Guidelines for Procurement. Contracts for large-scale civil works, such as rural roads and irrigation, will be awarded to pre-qualified contractors through local competitive bidding procedures acceptable to ADB. For small-scale civil works of less than \$10,000, procurement on the basis of comparison of at least three quotations from local contractors will be followed. The communities themselves may carry out small works costing \$1,500 equivalent or less. Contracts for supply of materials, vehicles, and equipment packages will be procured using international shopping procedures for contracts estimated to cost between \$100,000 and \$500,000 equivalent. Direct purchase procedures will be followed for small or off-the-shelf items valued at less than \$100,000.

Support to the Marine Protected Area Network (DANIDA 2003-06)

Sponsor: Danish Government/DANIDA

Executing Agency: Ministry of Fisheries/Quang Nam Peoples Committee

Beneficiaries:

Contractor:

Theme: Marine Protected Areas

Location: National/Quang Nam

Objectives:

1. Develop a legal and policy framework for a national MPA system;
2. Establish coordinating mechanisms for the development of a multi-sectoral approach to marine management issues
3. Develop management procedures at the Cu Lao Cham Archipelago MPA in Quang Nam, through capacity building activities and developing a multi-sectoral approach to management issues.

Type: TA

Summary: The three-year (2003 to 2006) project promotes “the sustainable management of marine and coastal natural resources in a national protected area system” through “supporting selected MPAs and developing appropriate policies and management procedures”. The project forms part of the Danish Environmental Assistance – Vietnam program component on Sustainable Management of Coastal Zones/MPAs, referred to as the ‘blue’ component.

Reversing Environmental Degradation (UNEP 1996-2006)

Reversing Environmental Degradation Trends in the South China Sea/East Sea and Gulf of Thailand

UNEP GEF Project

Cambodia, China, Indonesia, Malaysia, Philippines, Thailand, Vietnam:

Sponsor: GEF

Executing Agency: Secretariat for the Action Plan for the Seas of East Asia (EAS/RCU); Ministries of Environment in each country – MONRE in Vietnam

Beneficiaries: Cambodia, China, Indonesia, Malaysia, Philippines, Thailand, and Vietnam

Contractor: UNEP

Summary: Major outcomes will include an approved Strategic Action Program including, a targeted and costed program of action and a recommended framework for improved regional co-operation in the management of the environment of the South China Sea; a series of national and regional management plans for specific habitats and issues; 9 demonstration management activities at sites of regional and global significance; a regional management plan for maintenance of transboundary fish stocks in the Gulf of Thailand; pilot activities relating to alternative remedial actions to address priority transboundary pollutants and adopted water quality objectives and standards. Activities include national level analysis and reviews, management of demonstration activities and regional harmonization and co-ordination of national level actions.

Start date: 2000

Completion date: 2006

UNEP/GEF South China Sea Project Coordinating Unit

United Nations Building, 9th floor, block A, Rajdamnern Ave, Bangkok 10200 Thailand

Tel. 66-2-2881116, Fax 66-2-2812428, Website <http://www.unepscs.org>

Activities

Unresolved territorial disputes are a source of sensitivity in the region. Over the last several years the countries have demonstrated a willingness to co-operate in matters relating to environmental management, and there is an increasing recognition that the benefits resulting from co-operative environmental management actions are not dependent on the resolution of such sensitive issues.

Recognizing the sensitivities of the area however, it has been agreed that no activities shall be undertaken under this project in disputed areas of the South China Sea, nor shall issues of sovereignty be addressed directly or indirectly through project activities.

The project is divided into four major components:

- 1 Habitat Degradation and Loss
- 2 Over Exploitation of Fisheries in the Gulf of Thailand
- 3 Land-based Pollution
- 4 Project Co-ordination and Management

These components reflect the priority ranking determined at a regional level (Annex D) in which habitats and biodiversity related concerns and over-exploitation of marine resources ranked higher than either pollution or freshwater related concerns. Within the comparative ranking of importance of the habitats in the region, mangroves and coral reefs ranked significantly higher than seagrass and estuaries/wetlands. Over-exploitation of marine resources ranked almost as high as coral reef degradation whilst from among the pollution related issues land-based pollution and in particular sewage were considered the most important pollution issue in the region. Overall, pollution was considered less important than either, habitat degradation and loss, or over-exploitation of marine resources.

Assessment of the Living Marine Resources in Vietnam (Danida 1998-2003)

Code: 104.VIE.29

Sponsor: Danida

Executing Agency: Advisory Research Group and Research Institute for Marine Products in Hai Phong

Beneficiaries: MOFI (Research Institute for Marine Products in Hai Phong) / Advisory Research Group

Contractor: N/A

Theme: Fisheries

Location: N/A

Objectives:

Strengthen the capacity of relevant institutions in Vietnam to formulate and implement policies that will ensure sustainable utilization of fisheries resources;

Establish a reliable multi-disciplinary information base to monitor and assess Vietnamese marine fisheries, including information on resources;

Strengthen fisheries management advisory capacity within Ministry of Fisheries. Improve multidisciplinary research in fisheries management to support decision-making.

Type: TA

Start date: 1998

Completion date: 2003

Fisheries Stock Assessment Phase I (Danida 1996)

Sponsor: Danida

Executing Agency: MOFI

Beneficiaries: MOFI

Contractor: N/A

Theme: Fisheries

Location: N/A

Objectives:

To provide and estimate of the fishery resources within the Vietnamese Exclusive Economic Zone as a basis for the future development of the sector

Type: TA

Start date: 1996

Fisheries Sector Master Plan (Danida 1997)

Sponsor: Danida

Executing Agency: MOFI

Beneficiaries: MOFI

Contractor: N/A

Theme: Fisheries

Location: National

Objectives:

Strengthening of Fisheries Administration; Establishment of a Management Information System for the Fisheries Sector; Support to Freshwater Aquaculture Development, and; Development of the Potential for Marine Fish Culture

Type: TA

Start date: NA, Completed: Approx 1997

Support to Socio-Economic Development in Quang Binh (EU 1997-1998)

Code: 1997/49/IT

Sponsor: EU

Executing Agency: APS

Beneficiaries: Quang Binh province

Contractor: N/A

Theme: Relief

Location: Quang Binh province

Objectives:

Coordinated interventions to cope with the environmental emergencies and their devastating impact on economy

Type: TA

Start date: 1997 Completion date: 1998

The Port Development Plan in the Central Region of the Key Area (JICA 1997-1998)

Sponsor: JICA

Executing Agency: MOT

Theme: Ports, Waterways and Shipping

Objectives:

To formulate a long term port development plan for the period to 2020

Type: TA

Start date: 1997 Completion date: 1998

15. List of ODA projects of the fisheries sector for 2006-2010 – Table F1

List of ODA projects of the fisheries sector for 2006-2010

| Nr . | ODA project | Contents | Executing agency | Location | Implementation period | Fund (million USD) | | |
|---------|---|--|--|----------|-----------------------|--------------------|-------|-------------------|
| | | | | | | Total | Donor | Counter-part fund |
| 1 | Project on Improving Capability of the Capture fish and Management of offshore fishing activities. (TA and Loan) | <p>a. Developing the forecast methodology for capture fisheries activities:</p> <ul style="list-style-type: none"> - To establish the fishing and research fleet.. - To form the information network on fisheries dates. - To establish the centre for satellite informatics fisheries <ul style="list-style-type: none"> - To set up the data processing and fore - cast on fisheries.. <p>b. To establish the management Center for marine capture activities.</p> | National Directorate of fisheries Resource Exploitation and Protection – Ministry of fisheries 10, Nguyen Cong Hoan, Ha Noi. Tel: 04.7715082 Fax:84.4.8353363 | Hu Nui | 2006- 2010 | 140 | 120 | 20 |

APPENDIX F

Table F1 : Page 2

| | | | | | | | | |
|---|---|---|--|---|-----------|------|------|------|
| 2 | Project on Assessment and Institutional improvement of coastal areas and improvement of livelihoods of the people in central part of Vietnam (TA vµ ADB loan) | To do the poverty reduction and improvement of living standard of people through the sustainable development of the resource of coastal area in central part of Vietnam. | Ministry of Fisheries 10, Nguyen Cong Hoan, Ha Noi. Tel: 04.7719613 Fax:04. 7716702 | Quang Binh, Quang Tri, Thoa Thin-Hue, Quang Nam. | 2006-2010 | 80 | 64 | 16 |
| 3 | Project on Fisheries Sector Program Support (FSPS II) (DANIDA TA) | - Institutional Strengthening - Aquaculture development - Post harvest technology and marketing - Capture fisheries development | Ministry of Fisheries 10, Nguyen Cong Hoan, Ha Noi. Tel: 04.7719613 Fax:04. 7716702 | Coastal provinces | 2006-2010 | | | |
| 4 | Project on Aquaculture development. (ADB Loan) | To invest in aquaculture projects in selected provinces | Ministry of Fisheries Cong Hoan, Ha Noi. Tel: 04.7719613 Fax:04. 7716702 | Thanh Ho , , Kh , nh Hoµ , Sãc Tr ²ng , Cµ Mau | 2006-2009 | 60,7 | 36,1 | 24,6 |
| 5 | Project on aquaculture development for poverty reduction - hunger elimination, food security and environment and | - To do the poverty reduction and hunger elimination; conducting the environment and aquatic resources protection. - To construct a system of hatcheries. - To develop the sustainable models of aquaculture in remote and poor | Ministry of Fisheries Cong Hoan, Ha Noi. Tel: 04.7719613 Fax:04. 7716702 | Coastal area of North, Cental and South and remote and poor areas in highland and | 2006-2010 | 300 | 270 | 30 |

APPENDIX F

Table F1 : Page 3

| | | | | | | | | |
|---|--|--|---|--|-----------|------|-----|-----|
| | resource protection. (TA and WB loan) | area. To restructure the capture fisheries activities in the way of marine resource reproduction. - To do the environment management and fish disease control in area. - To establish the monitoring and environment awareness center. - To develop Human resources program in the area.. | | island places. | | | | |
| 6 | Project on establishing three fish markets. (Japans TA) | To develop three wholesale markets | Ministry of Fisheries Cong Hoan, Ha Noi. Tel: 04.7719613 Fax:04. 7716702 | Ha Noi , Hai Phong , Ca Mau | 2006-2009 | 16,5 | 15 | 1,5 |
| 7 | Project on Training center for fishermen. (Japan's TA) | To train the fishermen on the fishing technology. | Ministry of Fisheries Cong Hoan, Ha Noi. Tel: 04.7719613 Fax:04. 7716702 | Đà Nẵng | 2006-2010 | 7 | 6,5 | 0,5 |
| 8 | Project on Institutional strengthening of NAFIQAVED | - Improvement of Management capability. - Renovate the equipment for experiment and monitoring. | Ministry of Fisheries 10, Cong Hoan, Ha Noi. Tel: 04.7719613 Fax:04. 7716702 | NAFIQAVE ' branches | 2006-2009 | 8 | 7 | 1 |
| 9 | Project on mechanization of the fisheries sector. (TA and Loan) | - Strengthening the capability management of mechanization program of fisheries sector. - To invest in 4 mechanic Centers to | Ministry of Fisheries 10, Cong Hoan, Ha Noi. | Coastal area in North, Central, South and South West | 2006-2010 | 24 | 20 | 4 |

APPENDIX F

Table F1 : Page 4

| | | | | | | | | |
|----|---|---|--|----------------------------------|-----------|----|-----|-----|
| | | serve the activities of marine capture, aquaculture and seafood processing. | Tel: 04.7719613 Fax:04. 7716702 | South- West of Vietnam | | | | |
| 10 | Project on Setting up Training Center of Model Drill and technology transfer to fish farmer in Mekong River delta. Japanese TA) | <ul style="list-style-type: none"> - To develop the fisheries extension network. - To exploit the resource in sustainable way in eco areas. - Hunger elimination and poverty reduction. | Ministry of Fisheries 10, Nguyễn Công Hoan, Hà Nội. Tel: 04.7719613 Fax:04. 7716702 | Mekong delta | 2006-2010 | 7 | 6,5 | 0,5 |
| 11 | Project on aquaculture development in poor areas (TA from Germany) | <ul style="list-style-type: none"> - To develop the integrated aquaculture in coastal poor and hunger areas. <p>(Document under preparation)).</p> | Ministry of Fisheries 10, Công Hoan, Hà Nội. Tel: 04.7719613 Fax:04. 7716702 | In remote and coastal poor areas | | | | |
| 12 | Project on fishing boat repair and maintenance (TA and Loan) | <ul style="list-style-type: none"> - Prepare 100 units/year (100-1000CV) - Maintenance of 500 marine engines/year (100-1000cv) - manufacture spare parts and other equipment 1.500 ton/year. | BienDong Fisheries Corporation 30 Hùng Nghi, TP Hồ Chí Minh Fax: 84-8-8290124 | In South | 2006-2010 | 12 | 10 | 2 |

APPENDIX F

Table F1 : Page 5

| | | | | | | | | |
|--------------|---|--|--|-----------------|-----------|-------|-------|-------|
| | | | Tel: 84.8.8732271 | | | | | |
| 13 | Project on coastal shrimp culture in Kim Sơn, Ninhbinh province. (TA and Loan) | <ul style="list-style-type: none"> - To prepare the master plan for aquaculture in the area. - To construct new hatcheries. - To construct the infrastructure for aquaculture area. - To train the farmer the techniques for shrimp culture | <p>Department of agriculture and rural development</p> <p>Phông ton Thụnh , tho x: Ninh Binh. Tel: 030.871420. Fax: 84.30.875824</p> | Ninh Binh | 2006-2010 | 20 | 17 | 3 |
| 14 | Project on establishing the fisheries complex in HCM city (TA and Loan) | <ul style="list-style-type: none"> - To construct new fishing port and other related infrastructure. - International Auction hall and wholes market. - Frozen processing plant.. - Services facilities. - Internal road, water and power supply | <p>Department of agriculture and rural development.</p> <p>: 176, Hai Bù Trung, .TPHCM Tel: 84.8.9902743 Fax:84.8.9901598.</p> | TP. Ho Chi Minh | 2006-2008 | 18 | 15 | 3 |
| Total in USD | | | | | | 698,9 | 591,2 | 107,7 |

Appendix g: Main Fishing Grounds

| Fishing grounds | Location | Depth | Distances | Main species |
|----------------------------|-----------------------------------|----------|------------------------|--|
| Bach Long Vi | 19 30'-20 30N; 107-108 30E | 50m | 100 km to Hai Phong | long spine, seabream, round scad, lizardfish, threadin bream |
| South Long Chau | | 25-30 m | 40km to Hai Phong | <i>Sardinella gibbosa</i> |
| North Hon Me | | 22-28m | 40Km to Thanh Hoa | Anchovy, <i>Sardinella gibbosa</i> |
| Tonkin Gulf Mouth | 18 35-19 35N 106 30- 107 30E | 30-47m | | Round scad, <i>Sardinella</i> , rainbow sardine |
| Hon Gio | 16 30-17 30N 107 - 108 E | | | Threadin, threadin bream, toothless travally, gray bream, lizardfish |
| E-N Da Nang | 16-16 50N 108-110E | 100-300m | | Lizardfish, bigeye, threadin, bream, yellow seabream |
| E-S Quy Nhon | 13 10- 13-30N, 109 10- 109 40E | 50-200m | | Bigeye tuna, lizardfish, threadin bream, croaker |
| E. Phan Thiet | 10 30- 11 30 N 109 – 109 50 | <50 | | Lizardfish, bigeye, scad |
| S. Phu Quy (Cu Lao Thu) | | 50-200m | | Brushtooth lizard, bigeye, threadin |
| E. Con Son | 8 30- 9 30N 106- 107E | 25-40m | | Round scad, snappers, yellow-stripe trevally, threadfin bream, threadfin, lizardfish |
| Mekong Mouth | 9 – 9 30 N | 10-22m | | Threadin, sardinella, toothless trevally, croaker, snappers |
| Mekong | 9-9 50 N | 10-15m | | Yellow-stripe trevally, snappers, thrapon ponyfish, threadfin bream |
| WS Phu Quoc | 9 20-10N 103 40-104 20E | 10-30m | | Ponyfish, yellow-stripe trevally, snappers, thrapon, threadfin bream |

Appendix H: Aquaculture Policies

1. This appendix provides additional information on the status of aquaculture and related policies relevant to the aquaculture sector in Viet Nam.

2. Sectoral policies

2. Aquaculture has been strongly supported by government policy, with over 100 policy documents issued to support the sector's development. Some notable sectoral policies include:

- Decision 773/QD-TTg in 1994 as an important policy milestone in government support for inland and coastal aquaculture. It emphasized mobilization of domestic and overseas investment, and “reclaiming” of inland and coastal lowland areas for aquaculture. The policy included a significant social orientation to “step by step sustain and improve living conditions of people in new land” and an environmental orientation in “protection of coastal forests”. Implementation of the decision was mainly through development of infrastructure, with less emphasis being given to environmental management.
- In 1998 the Ninth Party Congress gave a further boost to aquaculture (and fishery) development in Vietnam with the following statement “.... *make use of advantages in fishery and develop fishery into a leading economic sector in the region..... strongly promote aquaculture in freshwater, brackish water and marine environment, especially shrimp farming following improved methods, efficiency and environmental sustainability. ... and enhance capacity for post harvest handling to meet domestic and international markets, and ensure the renewability and development of fishery resources.....*” This high profile led to further strengthening of Government policy support for aquaculture production with the Decision for “Directing principles of aquaculture development program period 1999-2010” (Decision 224/QD-TTg, 1999) signed by the Prime Minister. This important decision conveyed a clear policy for aquaculture development to 2010 “develop aquaculture in order to ensure food security, create materials for export, create jobs, increase income and improve living standards for rural people, contribute actively to socio-economic development of the country”. Investment was provided by government to implement the Decision, with a strong emphasis on infrastructure for shrimp farming in coastal areas. The scope of this ongoing program has now been expanded to include infrastructure requirements of other types of aquaculture.
- Since 1999, the Government has issued various policies on rural development that recognize aquaculture as having an important contribution to make in development of the rural economy. Resolution 09/2000/NQ-CP on the rural economy for example gives special attention to the fisheries and aquaculture sector noting “the fisheries sector is a high animal protein and demand increased producing sector in domestic and export markets, could become the most comparative export sector of the agricultural economy of Vietnam”. Shrimp farming is identified as a leading sector in the country's aquaculture production. Following this Resolution, the Ministry of Fisheries established “socio-economic” targets for the sector's development through the circular 05/2000/TT-BTS including: total fisheries production 2,450,000 tons in 2005 and 3,400,000 tons in 2010, of which aquaculture achieves 1,150,000 tons in 2005 and 2,000,000 tons in 2010; export value 2.5 billion USD in 2005 and 3.5 billion USD in 2010; and attracted 4 million laborers in 2005 and 4.4 million in 2010.
- Various policies have been issued on seed production, feed, use of chemicals and antibiotics, and biological products for aquaculture. An important policy decision regarding seed production, complementary to Decision 224 above, is the recent Prime Minister's Decision 112/2004/QD-TTg to approve an “Aquatic Seed Development Program to 2010”. The Decision provides a very

comprehensive program of support for seed production, with additional government funding to support its implementation.

3. These policies have been a success in terms of boosting aquaculture production and export value. However, implementation has also led to several problems. The 773 program for example provided significant investment in aquaculture infrastructure systems, such as water supply and drainage channels. Reviews of the 773 program though suggest the infrastructure was often poorly designed, investment was insufficient and developed with limited attention to environmental issues, despite the environmental considerations incorporated in the Decision. There was generally limited investment in management – the institutional mechanisms and services - to sustain operations after the initial infrastructure was developed.

Environment and natural resources

Environmental impact assessment

3. The Law on Environmental Protection passed by the National Assembly of the Socialist Republic of Vietnam on 27th December 1993 provides a sound legal basis for environmental management. Government Decree No. 175/CP (18th October 1994) and subsequent circulars provide guidance on implementation of the Law on Environmental Protection, including environmental impact assessment. Further guidance on implementation of EIA is provided in various circulars issued by the Ministry of Environment, Science and Technology (and now MONRES), including identification of projects requiring EIA, and division of projects into different categories.

4. Category I projects include aquaculture farms¹⁰ with an area of over 200ha; and investment projects to be implemented within or adjacent to areas of environmental sensitivity, natural resource protected areas, tourist areas, areas of internationally and nationally values historical and cultural sites. Category II projects include aquaculture projects of less than 200ha that would normally be subject to the permit requirements of the appropriate Provincial Authority(s) – previously DOSTE (but now DONRES) and Provincial Departments of Fisheries. Category II projects require that the project proponent conduct an EIA prior to submission to the relevant DOSTE of an application for ‘Registration for Securing Environmental Standards’. This is a shortened environmental assessment that identifies potential impacts, and management strategies in place to address these.

5. The legal basis for EIA of aquaculture in Vietnam is quite strong, however, it has not been widely applied, perhaps because it is seen more as an administrative and regulatory burden, rather than an important tool for better management and sustainable basis of aquaculture.

Wetlands

6. The decree on the conservation and development of wetlands was signed by the Prime Minister Phan Van Khai on 23 September 2003. This is the first ever legal document on the management of wetlands in Vie Nam. The decree provides an important legal basis for promoting sustainable management of wetlands in Vietnam. Wetlands, as defined in the decree, include those with unique ecosystems and high biodiversity values, have important water resource and ecological functions, and are of national and international importance. The Ministry of Natural Resources and Environment, the national focal point in the implementation of the Ramsar Convention, plays a state management role in the conservation and sustainable exploitation of wetlands, including formulating policy and legislation on the conservation and sustainable utilisation of wetlands. The decree stipulates that wetland conservation areas need to be managed and exploitation restricted. Constructions in the buffer zones that impact or potentially threaten wetland conservation (such as aquaculture) areas are

¹⁰ Government Decree No. 175/CP refers to “aquacultural farm”. However, it is not clear in this definition if it aquaculture estates (e.g. 773 projects). Article 9 of Decree 175/CP also refers to “overall strategies for regional development...”. This may also be interpreted to include regional aquaculture development plans and projects.

also prohibited. The decree also lays down that organizations and individuals who exploit resources on wetland areas take responsibility for protecting the uniqueness of the ecosystems and for conserving biodiversity. Following this Decree on the Conservation and Development of Wetland Areas, the Ministry of Natural Resources and Environment has issued the "Strategic Action Plan on the Conservation and Sustainable Exploitation of Wetlands to 2010". This strategic action plan is an orientation document for the implementation of the Decree. The policy basis for protection of wetlands, including coastal and inland wetlands, is therefore quite strong; however, implementation will be a challenge and will require substantial awareness raising, and building the capacity for management at a Provincial and local level.

Land and water

7. Policies concerning land administration have an important role in aquaculture development in Vietnam. The land law was recently revised in 2004. Many Provincial plans appear to be almost solely focused on land allocation, and in some cases prove difficult to implement because of the underlying complexities of land administration. Coastal land is under various ownerships, and renting arrangements, from short-term rent of 1 year, to longer-term allocation of land through the Red Book system. A Red Book effectively gives land title to the owner, for periods of 20-50 years. Red books for longer-term land use may be issued by the district authorities for smaller areas of land (<2 ha, as specific in land law), or provincial authorities for larger areas of land.

8. An important development concerning land use for aquaculture in coastal areas is Decree 64/CP (issued by the Prime Minister). This Decree provides a legal basis for long-term allocation of land, and allows farmers to convert lowland or low productivity land to aquaculture; the Decree has been a stimulus for planning of aquaculture areas, and also subsequently conversion of large areas of rice farms in the Mekong delta to shrimp aquaculture.

9. Farmers, and usually, higher Provincial and District Governments are interested to allocate land for long term lease through a Red Book. However, commune authorities may be reluctant, because allocation of Red Books has potential to lead to a loss of income. Land issues need to be properly understood and addressed in planning, through active involvement of government authorities and farmers at the commune level, as unrealistic land use planning is an important constraint to implementation of government plans and investments for the coastal aquaculture sector.

10. To date, land allocation and issuance of a Red Book, is not contingent on satisfying any environmental criteria. The main criteria for issuing the Red Book is whether the land is designated for aquaculture land use on provincial/district land maps¹¹. Linkage between land allocation and environmental criteria (for example issuance only in zone/planned areas) has potential to control development to environmentally suitable aquaculture areas; in practice the lack of proper environmental assessment, and poor aquaculture planning practices make such an approach difficult. The recent merging of the Department of Land Administration into the newly formed Ministry of Environment and Natural Resources (MONRES) may open opportunities for creating such linkages.

11. Allocation of marine areas for aquaculture is a new issue where more responsibility has been given by government to MoFI. The proposed mechanisms are outlined in the new Fisheries Law. Allocation of areas for commercial marine farming are the responsibility of the Provincial authorities, and allocation of marine areas for local people are the responsibility of District and Commune authorities. Implementation of this element of the new Fisheries Law will be critical in determining how the process of water allocation proceeds, particularly in relation to environmental and equitable development in coastal areas.

¹¹ According to studies carried out during 2003 under a UNDP project in north-central coastal areas, maps of land use available with the Department of Land Administration appear not always to coincide with maps prepared in Provincial/District aquaculture plans. This makes land allocation and planning even more confusing, with obvious governance difficulties, that should be addressed through better planning practices.

Poverty reduction

12. The Ministry of Labor, Invalids and Social Affairs (MOLISA) began coordinating the Hunger Eradication and Poverty Reduction (HEPR) Program in 1992 as part of a large focused effort to mobilize available resources for poverty reduction. Particularly poor communes have been identified, and special assistance provided through government and donor programs.

13. Recently the Government approved a program for poverty reduction among 157 poor coastal communes (106/2004/QĐ-TTg), of which a substantial proportion with livelihoods dependant on aquatic resources (identified as households with >30% of people with monthly incomes of Dong 100,00 – equivalent to US\$0.2 per day) represents a substantial opportunity for a targeted program of support to build capacity among supporting institutions and reduce poverty in coastal areas. Poor people involved with aquaculture and fishing are also found in communes outside the program.

14. Although the fishery and aquaculture sector is important in the livelihoods of many poor people in Vietnam, the involvement of MOFi in formulation of policy to implement poverty-oriented programs in the fishery sector has been fairly limited to date. Only recently, was the “Sustainable Aquaculture for Poverty Alleviation (SAPA)” prepared by Ministry of fisheries and approved by correspondence 321/CP-NN in 2001 and Decision 657/2001/QĐ-BTS. This policy provides the basis for implementation of more targeted interventions for poverty reduction in the fishery and aquaculture sector.

15. An analysis of Asian poverty reduction strategies (PRSWPs and NDPs) conducted by FAO interestingly shows Vietnam fairing rather poorly in the way fisheries sectoral issues have been incorporated in poverty reduction strategies. Although the sector in Vietnam is important in trade/consumption and poverty/employment terms, this significance is not properly reflected in contemporary PRSPs/NDPs. In fact, Vietnam, together with Thailand, is notable in this analysis of 12 Asian countries in terms of the limited representation of fisheries in poverty reduction strategies¹². This indicates a significant need to raise the profile of the fishery and aquaculture sector in Vietnam’s poverty reduction strategies.

Community organization and participation

16. In 1998 a Grassroots Democracy Decree was passed, which established the legal framework for the participation of citizens in local decision- making processes at the commune level and their right to "monitor" local government expenditures. Although the capacity of citizens to participate actively remains constrained, especially by their lack of awareness of their rights and entitlements, the decree is viewed as a step toward enhancing the transparency and accountability of local government officials.

17. In order to create an enabling environment for people’s participation the CPRGS points out the need to provide a legal framework for NGOs and fully implement the Grassroots Democracy Decree¹³. Recent developments in this area include Decree No. 88/2003/NĐ-CP drafted by MoHA provides guidance on the organization, operations and management of associations. The decree is considered an important step forward in legal basis to facilitate the development and operation of local NGOs and farmer organizations. The agriculture sector has seen development of successful farmer groups involved in marketing and extension. The Decrees have had limited application in aquaculture (or fisheries), but potential significance.

¹² Although the fisheries sector is deemed to be highly significant in either trade/consumption and/or poverty/employment terms in twelve countries covered in this analysis, such significance only translates into effective sectoral mainstreaming in five instances. There is a group of two countries – Thailand and Vietnam for whom the sector is significant yet this significance is not properly reflected in contemporary PRSPs/NDPs (Thorpe, A, 2004. FAO Fisheries Circular).

¹³ United Nations Vietnam. Informal Working Group on People’s Participation. <http://www.un.org.vn/donor/civil.htm>

Issues concerning formulation and implementation of aquaculture policy

18. The Government policy provides a comprehensive basis for support to aquaculture development in Vietnam, including measures for environment, poverty reduction and administration of the sector's development. Implementation of policy remains a constraint, with the following of particular concern.

Aquaculture policies include objectives for environmental protection, but in practice implementation of the environmental aspects of these policies has been weak. In some cases, they are in conflict. "Reclamation" of coastal land in the 773 program without effective environmental assessment has for example impacted on mangroves and other coastal wetlands¹⁴. Conversion of low value agricultural land to aquaculture has allowed substantial conversion of rice field land to aquaculture in the Mekong delta, causing salinization and hardship to some farming communities.

There is a legal basis for EIA of aquaculture, but EIA has been used in a very limited way for aquaculture projects. EIA is also generally not carried out as part of planning process, although the basic EIA legal framework supports this. There is therefore a need for considerable strengthening of environmental management in aquaculture planning. DANIDA is supporting MOFI on development of EIA guidelines that should provide more clarification on use of EIA in aquaculture.

Coastal shrimp farms often develop in an ad hoc and clustered way around basic infrastructure, leading to self-pollution problems and sometimes collapse of farming due to disease. Such issues can be addressed through applying EIA to aquaculture planning and establishment of special zones or areas for aquaculture within plans.

Implementation of 773 and 224 programs by Provincial administrations has substantially focused on development on infrastructure, or Master plans that focusing mainly on land use planning and infrastructure. Infrastructure development and land use planning have been poorly implemented. Lack of capacity, lack of effective local management institutions to implement projects and lack of investment have compounded the problem.

Significant attention in policy has been devoted to land conversion for aquaculture, contributing to significant expansion of shrimp farming in coastal areas, rather than improvements in efficient use of land, or better management of farming. While the area of shrimp farming has expanded, the yields per area of coastal land have not increased. With increasing pressures on the availability of land for aquaculture, and other uses in future, there is a need to shift attention towards improving efficiency of farming practices.

A frequent complaint from Provincial administrations is that there is insufficient investment to implement policy. There is a need to make further investment in small-scale infrastructure development such as water supply and drainage systems for aquaculture areas, but new ways need to be devised in such systems can be sustained. More detailed analysis of financing procedures and institutional mechanisms for infrastructure development and operation would be useful, perhaps learning from experiences of agriculture.

Implementation of policies for poverty alleviation in the aquatic resources sector need to be given more attention. MOFI also should take a more active role in ensuring the fishery and aquaculture sectors are properly incorporated, and resourced, as part of overall national poverty reduction strategies.

19. The newly approved Fisheries Law contains many provisions relating to aquaculture. The Ministry of Fisheries is in the early stages of development of specific regulations that will provide the legal instruments for implementation of the Fisheries Law. The new Fisheries Legislation provides a "clean slate" to reform and develop legislation that not only continues to support the development of this important sector, but better integrates critically important social and environmental issues into the mainstream of aquaculture development. This would include the delicate balancing of attracting private sector investment to the sector whilst supporting environmental protection and social development.

¹⁴ With many of the resulting aquaculture ponds having low shrimp productivity (10-200kg/ha/year), it is questionable in some cases whether this is any net economic gain from the lost wetland resources.

International agreements

20. Apart from the FAO Code of Conduct (CCRF), that is discussed in detail in the main text, there are several other international agreements relate to the aquaculture sector in Viet Nam.

Convention on International Trade in Endangered Species (CITES)

21. Viet Nam is a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES members are increasingly concerned about the trade in some endangered aquatic animals that are significant in fishery trade, recently including seahorses and Napoleon wrasse in the CITES appendix for trade regulation. International shipment of these species must be accompanied by an export permit certifying that they were legally harvested or farmed in a way that is not detrimental to the survival of the species. Whilst not directly affecting aquaculture at this time, there may be further restriction if species of aquaculture interest are added in future to CITES regulations.

Convention on Biological Diversity

22. Viet Nam is a signatory to the Convention on Biological Diversity. The recent meeting of the CBD has given special attention to improving the environmental sustainability of brackish water and marine aquaculture, emphasizing the importance of use of EIA, site selection within the framework of integrated coastal zone management, research on the impacts of mariculture on biodiversity and others¹⁵. Whilst implementation of these measures is not binding, or related to trade at present, it is likely that future international attention will be given to the biodiversity aspects of coastal aquaculture development, requiring Viet Nam to continue to seek and adopt better practices for environmental management of the sub-sector in coastal areas.

World Trade Organization/Sanitary and Phytosanitary (SPS Agreement)

23. Viet Nam is in the process of accession to the WTO, which means that the country will eventually have to comply with the rules of the WTO. This will have crucial implications for Vietnamese aquaculture and fisheries, consisting mainly of small-scale fishers and farmers.

24. A significant challenge faced by Vietnam after WTO membership will be the Sanitary and Phyto-Sanitary Agreement. To quote from an OXFAM analysis¹⁶ “Poor farmers will struggle to understand what these standards are never mind comply with them. If tough new standards are imposed upon accession without support a large number of Viet Nam’s poorest farmers will no longer be able to produce for export. Fresh fruits and the fisheries and seafood sectors will probably be most affected”. In WTO negotiations, Vietnam is requesting a transition period and technical assistance to implement SPS measures; such an approach seems amply justified considering the dominance of small-scale farmers, the difficulties in communication and extension, as well as fragmented market chains. Ultimately, the development of national standards to international levels will enable Vietnam to take better advantage of seafood export markets; however, substantial capacity will be required.

25. Negotiations to date include a request that Viet Nam adopt a bill to amend the Law on the Promulgation of Legal Documents to include procedures for publication and public comment. OXFAM consider that increased transparency will be good for increasing accountability in the decision-making process and improving transparency and accountability that will benefit the Vietnamese people including poor women and ethnic minorities.

¹⁵ Pages 138-140 of the Report of the Conference of the Parties to the Convention on Biological Diversity, Kuala Lumpur, 9-20th and 27th February 2004. UNEP/CBD/COP/7/21.

¹⁶ Unpublished OXFAM analysis of Viet Nam’s Accession to the WTO. March 2004.

26. WTO members can apply safeguards against imports of each other in cases of "market disruption", and such safeguards have been applied against China. The standards for application are much lower than in the WTO Agreement on Safeguards, and OXFAM consider this provision may lead to an increase in anti-dumping measures affecting Vietnam with implications for people in the fishery sector. Further analysis of WTO impacts would be useful to provide specific policy guidance on the implication of WTO accession for fisheries and aquaculture.

Ramsar Convention

27. Viet Nam is also a member of the Ramsar Convention on Wetlands, with the Ministry of Environment and Natural Resources as the focal point for implementation. Obligations under the Ramsar Convention have been considered in the development of the wetland strategy for implementation of the Wetlands Decree.

Appendix I: Aquaculture Trends, Sectoral Analysis and Environmental Issues

3. Aquaculture development trends

General overview

1. Aquaculture production, the area devoted to aquaculture ponds, and value of aquaculture production has increased significantly in the past 10 years. Total production in 1990 was 306,750 tonnes, and in 2003 MOFI estimates are around 1.1 million tons, within which is included an estimated 200,000 tonnes of inland capture fisheries. Based on MOFI figures, aquaculture makes up around 44% to total production of aquatic products.

2. Although not completely consistent with MOFI data, statistics from the Government Statistical Office (GSO, 2004) provide further understanding of trends within the aquaculture sector.

Table I1: Total aquaculture production

| | 1991 | 1996 | 2000 | 2001 | 2002 | 2003 |
|----------------|--------|----------|----------|----------|----------|--------|
| Area (ha) | 309760 | 498687.7 | 640496.1 | 755177.6 | 797704.8 | 865414 |
| Production (t) | 168104 | 423038.2 | 589600 | 709900 | 844800 | 966100 |
| Yields (t/ha) | 0.54 | 0.85 | 0.92 | 0.94 | 1.06 | 1.12 |

Source: GSO, 2004

Aquaculture production in 2003 is given by GSO at 966,100 tonnes, from an area of 966,100 ha, with an average production of 1.12 t/ha (Table I1).

3. Aquaculture area in Viet Nam continues to expand has increased from 309,760 ha in 1991 to 865,414 ha in 2003 (Table I2).

Out of this total, the largest area of aquaculture ponds is found in the Mekong delta. In terms of area devoted to different forms of aquaculture, in 2003 the largest land area is shrimp (579,388ha, mainly brackish water shrimp), fish (256,511ha), and 19,044ha for other forms of aquaculture.

Table I2: Aquaculture area (ha) in Viet Nam

| | 1991 | 1996 | 2000 | 2001 | 2002 | 2003 |
|-----------------|---------|----------|----------|----------|-----------|--------|
| Total area | 309,760 | 498687.7 | 640496.1 | 755177.6 | 797704.75 | 865414 |
| Red river delta | 42,815 | 66075.2 | 68349.8 | 71333 | 75686.4 | 81149 |
| North east | 19,332 | 29934.3 | 29847.3 | 31088.5 | 35873.6 | 40968 |
| Northwest | 2,522 | 3129.3 | 3505.4 | 3820.9 | 4432.7 | 4687 |
| North central | 23,038 | 27877.7 | 30641.5 | 32716.4 | 36291.4 | 39806 |
| South central | 8,972 | 12967 | 17299.4 | 19061.6 | 20446.8 | 19366 |
| Central plateau | 3,449 | 4265.5 | 5115.9 | 5643 | 5683.6 | 6175 |
| South east | 53,321 | 34143.7 | 40582.6 | 44409.1 | 48972.55 | 52083 |
| Mekong delta | 156,311 | 320295 | 445154.2 | 547105.1 | 570317.7 | 621180 |

Source: GSP, 2004

4. The value of aquaculture production (based on farm gate prices) has also expanded, reaching 5,448 billion Dong in 1999, or US\$347 million. Again, the Mekong delta dominates in terms of values with over 3,680 billion Dong, or 67% of the total value. Shrimp farming in particular provides significant value to aquaculture production in Viet Nam, with carps and freshwater species of lower farm-gate value

Regional trends

5. There are substantial differences between aquaculture developments in different regions of Vietnam.

North-eastern coastal region

6. The northeastern region contains the five coastal provinces of Quang Ninh, Hai Phong, Thai Binh, Nam Dinh and Ninh Binh, with well developed freshwater, brackish water and marine aquaculture, with potential for further development. Aquaculture production has expanded from

15,400 tons¹⁷ in 1990 to 98,800 tons in 2003. Freshwater aquaculture (mainly carps) contributes approximately 50-52 % to total aquaculture production, with brackish water and marine aquaculture makes up the rest. Household-level cage culture is found in the sheltered waters of the two provinces of Hai Phong (surrounding Cat Ba islands) and Quang Ninh (Ha Long and Bai Tu Long bays), farming groupers, cobia and pearl oyster. At present there are 6200 cage units in operation producing approximately 1700 tons of marine finfish. The region also produces mollusks, seaweeds and shrimp (*Penaeus monodon*) and recently the exotic *Penaeus vannamei*. Another feature of this region is the active trade in aquatic products with nearby China.

7. There are 52 small-scale freshwater hatcheries in the region, producing about 2.0-2.2 billion freshwater carp fry. There are about 30 shrimp hatcheries, in 2002 producing around 290 million shrimp PLs, including at least one recent large investment producing the exotic *Penaeus vannamei*. Locally produced shrimp PLs meet only 20-30% of the farmers demand, with the remainder supplied by central provinces, or import from China, including *Penaeus vannamei*. Marine fish seed comes collection of wild seed, or hatchery reared fish from Cat Ba, or import from China or Taiwan. Although most aquaculture in the area is small, household scale, there is a trend towards more industrial intensive farming of shrimp, and marine fish.

Northern inland and Red river areas

8. This inland region comprises 14 mountain provinces in the northeast and northwest of the country, and six inland provinces in the Red river delta, including some of the poorest and remote regions in the country. Aquaculture in the Red river delta provinces in particular has expanded in recent years, from 13,300 tons in 1990 to 76,400 tons in 2003, from 21985 ha to 36100 ha in the same period. Due to land use pressures, increased aquaculture production in the Red River delta has been mainly the result of intensification, from 0.6tons/ha/year in 1990 to 2.1 tons/ha/year in 2003. Although volumes are smaller, midland and highland provinces have also seen significant growth in aquaculture production, from with a fourfold increase from 6443 tons in 1991 to 29,130 tons in 2003, from a two-fold increase in culture area. The success of aquaculture development through UNDP projects in some poor mountain communes (UNDP, 2000) has led to increasing interest in aquaculture for poverty reduction in this impoverished region.

9. The traditional polyculture and integrated farming system (garden-fish pond-livestock pen as called VAC) in some cases with modifications (VAC with forestry-R or AR) are commonly practiced in the Red river delta. Rice-cum-fish as well as rice fish rotation are also common in most lowland and midland provinces. Although statistical information is sparse, rice cum fish and rice fish rotation has expanded since 1990, with around 10,000ha of low lying paddy field in the Red river delta and in some midland and highland provinces (Phu Tho, Bac Giang, Hoa Binh and Son La), contributing to diversification of rice-based agriculture farms in the region. Fish cage culture has been widely practiced in many mountain provinces, mainly involving grass carp, but disease outbreaks have seriously constrained this type of aquaculture.

10. Freshwater carp species (Chinese and Indian carps) dominate (85-90%) this region, while diversification of culture species has potential for future development. The Red River delta provinces have a strong fish hatchery and nursery network with more than 100 hatcheries of all sizes. In the northern mountains a decentralized seed production system and network has been introduced and has help overcome some of the fish seed shortages in this remote region.

North central coastal area

11. Central Viet Nam has six provinces running more than 600 km of coastal line, from Thanh Hoa to Thua Thien Hue province. The region is characterized by a very long costal line with long sandy beaches and a narrow coastal plain (mainly rice fields), with remote mountains to the west.

¹⁷ Unless otherwise specified, the statistical data in this section come from GSO,2004.

River systems in the region are short with limited estuarine areas and a seasonal current. Aquaculture has been growing in the region over the last decade, from 5340 tons in 1990, 23,900 tons in 1999 and a major jump to 45,988 tons in 2003. This increase has come from expansion of freshwater aquaculture, dominated by Chinese and Indian carps, but also growth of brackish water farming. Freshwater aquaculture is mainly integrated farming in small ponds or in rice paddies. Freshwater seed, although easy to produce, is limited in this region, due to climatic conditions and poor infrastructure. There are only 25 small-scale hatcheries producing approximately 700-800 million carp fry meeting, supplying only 50 % of the demand. According to the Department of Fisheries in Nghe An, aquaculture in remote western mountain areas is constrained by lack of seed.

12. Traditional brackish water farming has been practiced for some time in this region, based on extensive ponds built into estuarine areas, but more organized shrimp aquaculture started in the early nineties. Shrimp production (*P monodon*) in the region increased from 170 tons in 1990 to 9300 tons in 2003. Increased production has come mainly from expansion of culture areas, although intensification has started in some locations during the last 3 years. Seed demand for *P monodon* in the region is growing, with significant expansion of hatcheries over the past two years. However, demand outstrips supply and the hatcheries in this region can meet only 25-30 % of the demand, the remainder being imported from Da Nang and Khanh Hoa provinces in Southern central Vietnam, bringing problems of quality control and disease. A hatchery of *P vannamei* is being constructed in Ha Tinh during 2004, to stock a large commercial shrimp farm of several 100 ha. Seaweeds (*Gracilaria* sp.) are also cultured in a small way in coastal lagoons, as are clams reaching with an estimated production in 2003 of 7,400 tons.

13. Marine areas are quite deep and exposed in the Northern central provinces, with some shelter provided by a few islands. However, water quality in general is very good, with limited influence of freshwater large rivers. Norwegian style and flexible rope cage have been tried for marine finfish culture in Nghe An province since 1999 on an experimental basis by RIA-1, and recently by private investment. To date there are 40 Norwegian style cages and a few flexible cages made from ropes installed in Nghe An for cobia, grouper and red drum culture. About 100 other wooden raft cages are in operation in Nghi Son bay, Thanh Hoa province. Last year, about 70 tons of cobia and grouper were harvested. In this year, it is expected about 100-110 tons of cobia and groupers and red drum will be produced. The long beach and estuarine areas of the narrow and small rivers are used for stocking of clam species. According to the MOFI review of 2002, Northern Central provinces produced 5000 tons of bivalves, 950 tons of crab and 1500 tons of fresh agar seaweed (*Gracilaria* sp).

South central coastal area

14. The Southern central coastal is located in the south part of central Viet Nam with a coastline about 600 km. The region has considerable climatic and geographical advantages for brackish water and marine aquaculture, while freshwater aquaculture plays only a minor role. Aquaculture production in the region increased from 1054 tons in 1990 to 9784 tons in 1999 and reached 19,498 tons in 2003. Shrimp farming is dominant. From 589 tons in 1990, it has increased to 4135 tons in 1999 to 15,524 tons in 2003, making up 78% of total aquaculture production. Marine mollusks are also cultured, but with limited production at present. Pearls, mussels and experimental abalone, scallops and *Babylonia* are grown, benefiting from the research program of RIA-3 and Nha Trang Fisheries University located in Nha Trang. Marine cage culture of groupers, and recently cobia, is found in this region, and there has been recent foreign investment in marine fish cage culture and hatcheries in Khanh Hoa, so further expansion of marine fish farming is expected in the future. The region is the largest lobster producer in Viet Nam. According to MOFI information, there were about 26,480 lobster cages producing about 1,000 tons of lobster in 2002. This region is the largest producer of shrimp (mainly *P. monodon*) seed in Viet Nam. In 2003, there were 2702 shrimp hatcheries/nurseries in this region, contributing about 35% of national total shrimp seed production. Shrimp PLs from this region are exported to coastal shrimp farming areas throughout Viet Nam.

15. The central plateau region of Tay Nguyen has a small amount of freshwater aquaculture, mainly involving freshwater pond farming, together with a number of small and medium sized reservoirs stocked with carps. GSO figures estimate around 6,175 ha of freshwater aquaculture area in 2003. Cage culture of grass carp was also found in this region, although this has apparently declined due to disease problems. Snakeheads are also cultured in cages in at least one reservoir.

Southern eastern region

16. Aquaculture development in this region is very diverse, and expanding. The production has grown very quickly from 6,448 tons in 1990 to 48,013 tons in 2003. Mollusk farming, shrimp culture, lobster and marine fish farming are important aquaculture activities in this region. Shrimp farming has grown fast in recent years from 465 tons in 1990 to 14,846 tons in 2003. Brackish water and freshwater fish farming makes up less than 10% of the total. In Ninh Thuan and Binh Thuan there are 450 small-scale lobster cages in operation producing about 40 tons of marketable size lobster. While in Baria-Vung Tau and Binh Thuan provinces, there are about 1500 cages for grouper and cobia culture producing around 200 tons up till 2003, although apparently declining in 2004 due to problems with marketing of cobia. There are 1606 shrimp hatcheries (2002 data) producing 7.8 billion *P monodon* PLs for local use and export to other provinces in the North and Mekong delta. There are some foreign investment projects in this region, including Taiwanese investment on marine fish farming for cobia since the late nineties.

Mekong delta

17. The Mekong delta provinces from Long An to Ca Mau contributes the largest volume and value to Viet Nam's aquaculture production. Aquaculture in the Mekong Basin is a diverse activity. It encompasses breeding, rearing and sale of shrimp, prawn, mollusk and fish fry and fingerlings, and growing of wild or hatchery-reared fry and fingerlings in enclosed or semi-enclosed water bodies, such as ponds, rice fields, mud flats and cages. According to GSO data, total aquaculture production in 2003 was 324,400 tons, from a culture area of 616,600 ha

18. In brackish water areas, the most widely cultured species is tiger shrimp *P monodon*, raised in ponds. There are a few intensive shrimp farming projects culturing the exotic *P vannamei*. Shrimp are grown in intensive commercial shrimp farms and throughout large areas of extensive traditional ponds, including mixed shrimp-mangrove and shrimp-rice farming systems. Crabs, mollusks and brackish water fish are also farmed, mainly in low input extensive traditional farming systems. There is limited marine aquaculture development in the Mekong delta, except some marine fish cage farming in Kien Giang province. Brackish water shrimp production makes significant contributions to export earnings, although yields per land area are still low.

19. In freshwater areas, the most commonly cultured fish species in Mekong Delta ponds are river catfish *P. hypophthalmus* (tra), silver barb *Barbodes gonionotus*, common carp *Cyprinus carpio*, tilapia (mainly *O niloticus* and *O. mossambicus*), giant gourami *Osphronemus gourami*, sand goby *Oxyeleotrix marmoratus*, hybrid catfish *Clarias gariepinus*, *C. macrocephalus*, silver carp *Hypophthalmichthys molitrix*, Indian carps and snakehead *Channa striatus*. Freshwater prawn (*Macrobrachium rosenbergii*) is also cultured. Polyculture is the norm with stocking regimes and densities varying with feed availability, water quality and market price. Fish pond farming in the Mekong Delta has traditionally been integrated under the VAC system. However, VAC systems are becoming less common, as farms specialize in more intensive farming of higher value species mainly catfish but also tilapia. Rice-fish and prawn farms are also common. Extensive use is made of agricultural and fisheries by-products, and abundant cheap labour, which keeps fish prices relatively low. Although most freshwater production is predominantly for domestic consumption, catfish, cultured in ponds and cages, has become a major export earner.

20. Over the past 5 years, aquaculture has expanded quickly in the Mekong delta, both in area covered and production. There are also ambitious plans for future development, and recent

government plans call for raising the output to 1.8 million tons, or 60 per cent of the country's total, in the next three years, and by expanding the fresh- and brackish-water aquaculture, to cover 815,000 ha by 2010. All three Mekong delta provinces visited during the preparation of this report give a high priority to aquaculture development, particularly in brackish and marine coastal areas.

Table H3: Shrimp hatchery development in Vietnam.

| Region | 1985 | 1990 | 1995 | 2000 | 2001 | 2002 | 2003 |
|---------|------|------|------|-------|-------|-------|-------|
| North | | | | 6 | 10 | 17 | 769 |
| Central | | | | 2,139 | 2,653 | 3,483 | 2,702 |
| South | | | | 791 | 1,114 | 1,268 | 1,546 |
| Total | 5 | 500 | 685 | 2,936 | 3,777 | 4,768 | 5,017 |

Sub-sectoral trends

Freshwater aquaculture

21. Freshwater aquaculture is now well established and continues to expand in inland areas. The farming systems are characterized by being quite diverse, relatively low risk, and have been shown to adoptable by agriculture farmers without major problems. Environmentally sound, integrated, polyculture systems in ponds or rice fields are widely practiced and dominated by (exotic) carps. Semi-intensive and intensive monoculture culture of catfish and tilapia is now well established in both Mekong and Red river deltas, and there are trends towards intensification and monoculture. Cage culture has developed in the north and some reservoirs, with moderate success, but the major expansion of cage farming has been with catfish farming in the rivers of the Mekong delta.

22. Freshwater aquaculture has demonstrated its potential to contribute to diversification of small-scale agriculture households in the Mekong and Red river deltas and food supply and poverty reduction in subsistence-level farming in remote northern mountain areas. Opportunities exist to further expand freshwater aquaculture for further diversification of agriculture farms, including remote mountain areas.

23. Freshwater aquaculture provides a low risk and environmental sound option for diversification of on-farm income for agricultural households. Pilot level successes in poverty reduction through aquaculture in remote upland areas, such as through the UNDP northern upland projects¹⁸ suggest substantial opportunities for expansion of aquaculture in mountain areas to contribute to poverty alleviation.

24. Freshwater fish seed production for freshwater species is quite well established with an active private sector engaged in hatching and nursing in many parts of the country. In Can Tho city, for example, there is an active small-scale fish hatchery and nursing network, including the active involvement of women (Minh et al, 1996). Fish seed quality is a problem in some areas, and genetic management needs to be improved. In the new fish seed program, MOFI is also keen to promote species diversification through culture of indigenous species and introduction of new exotics.

25. Feed is not a constraint for freshwater carp species in polyculture and integrated systems, but with trends towards monoculture, and in intensive freshwater aquaculture, it is becoming increasingly important. According to Edwards (2004) feed for lower cost freshwater fish will not be able to compete with higher value marine and brackish water species and freshwater fish will need to be fed increasing amounts of plant-based proteins. Water quality and availability may well become a future constraint to freshwater aquaculture.

Marine aquaculture (finfish and mollusks)

26. Marine aquaculture is being given a high priority for development by Government, with an ambitious plan for a finfish production of 200,000 ton by 2010 and further development of mollusk

¹⁸ Aquaculture Development in the Northern Uplands of Vietnam (UNDP project VIE/98/009/01/NEX)

and agar seaweed production. At presently, marine culture relies mainly on very limited finfish species (cobia, groupers, red drum and sea bass) as well as crustacean (lobster) and mollusks (clam, blood cocker, pear oyster, oyster, blue mussel) and some seaweed species. Although no accurate statistics are available, mollusk production dominates in volume. There are significant regional differences in marine aquaculture, but all coastal areas appear to have potential for further expansion of marine aquaculture.

27. Marine hatchery technology for three marine finfish species and mollusk has been developed to some extent (in 2004, more 100.000 fingerlings of 15-25 cm of cobia and more than 120.000 fingerlings of grouper and 50.000 of red drum were produced in Cua Hoi). However, supplies are limited and the survival rate of larvae in different development stages remains low. Future development of marine fish and mollusk farming will certainly require investment in hatcheries and nurseries to supply seed. Marine fish hatcheries are found in Ha Long Bay (Cat Ba island and near Ha Long city) and RIA1's hatchery facility at Cua Lo (Nghe An province) in the north; at Vung Tau near Ho Chi Minh City in the south. Nha Trang in south-central Viet Nam has some foreign investment in a marine fish hatchery, and is the site of further commercial (private) and government marine fish hatcheries. At present there is one Taiwanese supported private hatchery in Van Ninh district near Nha Trang spawning grouper and sea bass. The University of Fisheries in Nha Trang has some non-commercial spawning capacity for their own research purposes. The output from hatcheries is expanding quickly. Estimates of grouper production in the north-central Viet Nam suggest 150,000-200,000 grouper fingerlings were produced in 2003, compared to 70,000 in 2002.

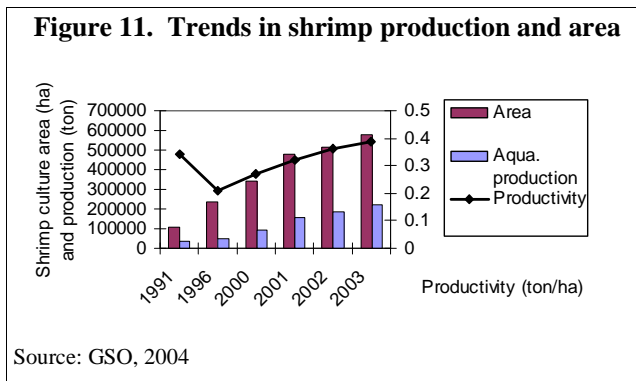
Brackish water aquaculture

28. Brackish water aquaculture in Viet Nam is dominated by shrimp farming, although crabs, mollusks, and brackish water fish are also cultured in extensive traditional ponds from the north to south of the country. Much government attention has been placed on shrimp farming, which now makes a substantial contribution to export values for the country.

29. Extensive, traditional forms of shrimp culture, have existing for some time, but there was a significant expansion in 1990s and early 2000's. Perhaps the most spectacular increase in shrimp farming area followed the government policy change allowing farmers to convert unproductive rice fields, uncultivated areas and salt pans into aquaculture ponds. The area for shrimp culture jumped increased from 250,000 ha in 2000 to 478,000 ha in 2001, largely in the Mekong delta. Although the growth rate slowed down, during 2002-2003, the area of shrimp culture in Viet Nam still continues to increase and at the end of 2003 there were an estimated 550,000ha of land used for shrimp culture. Currently Viet Nam is among the world's largest shrimp farming nations in terms of area cultured. Figure 11 shows the trends in production, yields and area, having barely increased since the early 1990's. Yields continue to be low by Asia regional standards, and indicate considerable scope for improved efficiency of use of land and better farming practices

30. Shrimp farming systems in Viet Nam are still dominated in terms of area by low input, extensive, farming practices, and in the Mekong delta by rice-shrimp farming systems, and some mixed mangrove-shrimp systems. The main shrimp species cultured in Viet Nam are

Penaeus monodon, *P. merguensis*, *P. orientalis* and *Metapenaeus ensis*, among which *P. monodon* is the most important in terms of production. The white shrimp (*P. vannamei*) was introduced in 2000, but production is confined to a few intensive commercial farms and is overall still low.



31. An extensive network of over 5,000 small-scale hatcheries supports shrimp farming, in 2003 producing around 25 billion shrimp PLs. These hatcheries are concentrated in the Central Southern provinces. However, quality and shrimp disease are major problems. Currently, Mekong delta and Northern provinces are trying to produce shrimp seed by themselves to meet local demand and minimize the risks of spreading shrimp diseases and improving quality. Shrimp farming is also supported by feed and chemical suppliers, makes the major contribution of shrimp for export and is a major employer in coastal areas of Vietnam, but particularly in the Mekong delta. The expansion of shrimp farming has been increasingly controversial, contributing to loss of mangrove forests, degraded water quality, social problems, and significant risks associated with shrimp disease.

32. Risks associated with shrimp farming are prompting increasing interest in diversification of coastal aquaculture species and farming systems. Brackish water farming systems in the Mekong delta traditionally harvest a range of aquatic products, including fish, mollusk, crabs and shrimp, and further development of such systems would provide better lower risk options for small-scale poorer farmers and fishers in brackish water areas. Mud crab farming for example is a lower risk option that has been adopted by poor farmers, for example Khmer fishers with small traditional ponds in Bac Lieu. Local markets are available, crabs are suitable for simple collection and transport methods and can be cultured with minimal inputs in traditional ponds. Sustainable development of crab farming will depend on development of hatcheries, but technology is becoming available in Vietnam to produce hatchery-reared crabs. Brackish water fish culture is also practiced in some areas, with species such as mudskipper, sea bass, mullet and milk and tilapia farmed, mainly on an extensive scale, but deserves more R&D attention.

Environmental issues

33. Aquaculture development of aquaculture in Viet Nam also has significant environmental implications. Aquaculture may impact the surrounding environment and is affected by changes in the environment. Small-scale aquaculture can also contribute to environmental improvement but on- and off-farm environmental interactions need consideration in the promotion of aquaculture in Viet Nam.

34. Aquaculture is vulnerable to both natural and man-made environmental change. The severe flood in 2000 caused significant damage to aquaculture ponds in the Mekong delta (van Anroy, 2000), perhaps compensated to some extent by increased fish catches resulting from the flood. Pesticide use in agricultural areas is of increasing concern for water quality and human health, as well as aquaculture (Phuong 2002). Integrated pest management (IPM) incorporating (valuable) fish or prawn may offer opportunities to reduce pesticide use in rice fields, and should be more widely promoted. Aquaculture infrastructure as well as fisheries is also vulnerable to coastal typhoons and associated floods that are a feature of Viet Nam's coastline.

35. Small-scale aquaculture may have positive impacts on the environment. Ponds on integrated farms such as the traditional VAC system recycle waste and store water that can be used for livestock, watering vegetables, and as a domestic water supply during the dry season. Integration of fishponds into water resource schemes and irrigation networks can also create more income from water resources. As part of a household livelihood strategy, a pond is an important natural asset for many small-scale farm households. For many years also, the sewage fed fishponds and agriculture fields in the outskirts of Hanoi in Thanh Tri have provided a cost-effective and environmentally sound way of producing food and treating domestic effluent.

36. Most water and effluent from freshwater aquaculture ponds can be recycled and efficiently used on agricultural crops without environmental concern. By contrast, more intensive farming practices, particularly those associated with large concentrations of cage farms where wastes are discharged directly into the water body without treatment, risk localized water pollution. This has led to deterioration of water quality and fish disease outbreaks, for example, with grass carp cage culture in the reservoirs in Dak Lak (Phillips, 1998). Such problems can be addressed through better cage culture management practices that reduce feed losses, better site location for cages, and localized

management arrangements that reduce conflicts and maintain the number of cages and production within the assimilative capacity of the water body.

37. Freshwater aquaculture systems in Viet Nam also rely heavily on exotic (introduced) carps and tilapias. No problems have been reported to date, and exotic carps contribute significantly to aquaculture production and farm income. However, care has to be taken with introduction of new exotic species, due to risks of disease and impacts on aquatic biodiversity, through adoption of risk assessment procedures. There have been a number of fish disease outbreaks in Viet Nam, and it is likely that such problems will increase in future with further expansion and intensification of aquaculture. The spread of serious aquatic animal diseases is becoming a feature of international trade, making it important for Viet Nam to develop and adopt effective measures for aquatic animal disease control, to protect livelihoods of people involved in aquaculture, and trade.

38. The conversion of wetlands and even parts of rice fields to fishponds can lead to losses in wetland habitat and wild fisheries. This is an important concern in Viet Nam, where significant coastal areas have been converted to aquaculture. Such problems need to be avoided through better planning approaches that consider both aquaculture and wild fisheries. Aquaculture should “add-value” to natural resources and the livelihoods of people that depend on natural resources.

39. In coastal areas, environmental concerns from wetland conversion are significant. Expansion of shrimp farming has contributed to loss of coastal mangrove wetlands in Viet Nam (Hong and San, 1993), and has also encroached into coastal estuaries, many of which are important fish nursery areas. During the period from 1975 to 1990 an estimated 75,000 ha of mangrove forest was removed because of fuel exploitation, agriculture and aquaculture development, and although replanting has taken place have been significant impacts on biodiversity, coastal erosion and water quality (Nhuong et al, 2004). Such problems have to be addressed through better planning and siting of aquaculture ponds away from mangroves, raising awareness on the importance of mangroves and conservation of important wetland habitats. The new Wetland Decree provides a sound legal basis for protection of wetlands and implementation if required. Several studies and international NGO’s (e.g., EJF, 2003) have raised concern about the environmental and social aspects of development of shrimp farming in Viet Nam.

40. Siting of shrimp ponds in rice farming areas, following the major conversion in 2000 has raised incomes among many shrimp-rice farming households, but has resulted in salinization of agriculture areas. Such problems need to be managed through improved water management and farming practices in this hydrologically complex area in the Mekong delta. Recent expansion of shrimp farming in sandy areas, promoted by MOFI as a means of improving livelihoods of the many poor people in Viet Nam living in coastal sandy areas, has also led to concerns over the salinization of freshwater aquifers, due to seepage and extraction of groundwater. Studies on the impacts of sandy soil shrimp farming ongoing by IFEP, raise significant questions about the economic and environmental sustainability of this practice.

41. Intensive farming practices, shrimp and marine fish farming, can lead to water quality problems due to discharge of effluent. Such problems can be managed by better feed management, and treatment of effluent from intensive ponds, and ensuring density of cage farms are kept with assimilative capacity.

42. There has been a dramatic recent rise in the use of trash fish in aquaculture with the development of marine cage culture of grouper and lobster, and the expansion of freshwater culture of river catfish in cages, ponds and pens. Recent estimates from Edwards (2004) suggest inland aquaculture consumes between 64,800t and 180,000t (solely catfish), coastal between 72,000t and 144,000t, with a total between 177,000t and 364,000t. There are also conflicting uses for trash fish for livestock feed, fish sauce and direct human food as well as for a direct aquaculture feed and fishmeal manufacture in some areas. Collection of so-called trash fish for aquaculture and other uses is also a concern because such fish usually contain juveniles of economically important fish. Availability of

trash fish as a direct feed is likely to restrict the future expansion of aquaculture as supplies are finite and alternatives and improvements in feeding efficiency are required.

43. Aquatic animal disease problems are also significant, causing major economic damage, particularly in the shrimp sector. Major problems include white spot disease (WSSV) in shrimp, red spot disease in grass carp, and others. Whilst some progress has been made, shrimp farming still suffers from disease problems, which have led to debt among farm households, and in some cases forced farmers to sell land. Better quality of disease free seed supplies, together with overall lifting of farm management practices, and improved planning and regulatory frameworks, will be essential to reduce this risk. Investment in facilities and people is required at all levels, from farm to MOFI, to build the capacity to reduce risks to the aquaculture sector from aquatic animal diseases. MOFI has recently approved an environmental and disease monitoring program, but this needs further support in terms of design, coordination, skilled people and facilities if it is to be successfully operated.

44. Some of the environmental problems in aquaculture have arisen because of a poor planning framework for aquaculture development, particularly in coastal areas, emphasizing the general need to strengthen planning processes for aquaculture, and integration within coastal zone management schemes. Better zonal planning and management of aquaculture is required, in inland and coastal areas. Existing plans are mainly based on zoning of land areas, with limited attention to environmental impacts or management. There is a need to review and improve many of the existing zonal plans, including conducting more comprehensive EIA, and implementing and investing in realistic environmental management plans.

Appendix J: Markets and Processing

4. Market Channels

1. The marketing of fish, shrimp and other capture and culture products in Viet Nam is complex. There are numerous species, product forms, marketing channels and markets. Products may be marketed live by farmers or sold to middlemen who assemble product and sell to processing plants (or in the case of shrimp fry or grouper fingerlings, to other producers). At the same time, few data exist on marketed species, volumes and prices, making definitive analysis of the markets and marketing chains impossible. The following sections summarize available information on the domestic and export markets relevant to Vietnamese aquaculture. For many products (notably shrimp), the capture and culture sectors produce the same species that are handled by the same processors. In many cases marine capture species compete in the same markets as culture products. It is therefore necessary to give consideration to both capture and culture fisheries products in an analysis of the market or market opportunities.

2. About 170 marine species are considered to be of commercial importance in Vietnam. About 30 species are of significance to marine fisheries; with shrimp being the most important by value, followed by cephalopods, scads, croakers, snappers, sardines, lizardfish, jacks and tunas. Tunas have increased rapidly in importance in the last five years to reach production of around 50,000 tons annually from a low base. Of the exploitable fish stocks, it is estimated that some 60 per cent are pelagic (primarily surface dwelling) species and 40 per cent are demersal (mainly dwelling at or near the sea floor or reefs). Carps (Chinese and Indian) are dominant among freshwater cultured species.

3. Marine fish are normally sold to agents at the port or jetty. Fishers often develop long-term relationships with market traders or wholesalers who provide them with credit for fuel, ice and other supplies, and can provide finance for off-season needs or even assist with vessel purchase. Agents will usually send trucks to pick up fish from the vessel even if landings are seasonally away from the main port. In the past, most fish used to change hands four times between the vessel and the retailer or processor. However, more normally, there are only two changes of ownership. Agents are almost all family businesses (87%) or private enterprises (11%), with only 2% being public enterprises, demonstrating the dominance of the private sector in fish marketing. Agents handle an estimated 90% of fish landings and production (Dang & Ruckes 2003). Only 31% of agents use storage, and agents thus have limited capacity to even out supply.

4. For offshore vessels, fish may be sold at sea to buyers on transport vessels or collector vessels run by their agents. For example the Vung Tau fleet may spend many months at sea, transshipping product at Con Dao, and purchasing ice and other inputs from the collector vessels or from the new port. Where marine product processing plants are present, vessels may contract to supply them with product. Factories can seek product over a wide area. For example the crab canning factory near Nha Trang purchases marine crabs through a network of agents between Vinh and Rach Gia (Kien Giang). In the north, significant quantities of fish and other products are purchased by Chinese agents using collector vessels, providing a strong market for fishers from Quang Ning and Hai Phong in particular.

5. Aquaculture products follow a similar path to marine fish. However, some contract directly with processing plants. Dang & Ruckes (2003) estimate that 33% of aquaculture products are sold directly to processors and a further 25.5% to processors through wholesalers. Almost all processed product (95.5%) is destined for export.

Wharf/Farm Gate and Export Prices

6. Few data are available on producer or retail prices. FICEN does collect some data such as those presented in Table J-1, which summarize available data on shrimp price at the farm gate in the four main regions. The most detailed data are for the Mekong, which suggest that the price for large shrimp have increased over the past 12 months (from about Đ120 to Đ130/kg for shrimp over 50

grams (<20/kg). Prices for smaller shrimp (41-50/kg) have declined from around Đ85/kg in July to August 2003 to around Đ70/kg over the same period in 2004. In future, consideration should be given to collecting and disseminating detailed price data on a daily or weekly basis. Study of collection, analysis and dissemination systems is merited. A price of Đ70,000/kg (\$4.50) is marginal for intensive shrimp production, raising questions about the viability of the system, particularly where only one crop can be grown each year due to climatic factors (e.g., in the north).

Table J-1 Farm gate price of shrimp (Đ'000)

| Months No/kg | North | | N. Central | | S. Central | | Mekong Delta | | | | |
|-----------------|-------|-------|------------|-------|------------|-------|--------------|-------|-------|-------|-------|
| | 31-40 | 41-50 | 31-40 | 41-50 | 31-40 | 41-50 | <20pcs/kg | 21-25 | 26-30 | 31-40 | 41-50 |
| Feb-03 | | | | | | | 130 | 120 | 105 | 80 | 65 |
| Mar-03 | | | | | | | 135 | 116 | 100 | 80 | 67 |
| Apr-03 | | | | | 95 | 74 | 118 | 105 | 88 | 80 | 75 |
| May-04 | | | | | 95 | 75 | 120 | 108 | 95 | 80 | 60 |
| Jun-03 | | | 87 | | 75 | 65 | 118 | 105 | 88 | 80 | 60 |
| Jul-03 | 85 | 75 | 80 | | | | 120 | 114 | 108 | 96 | 90 |
| Aug-03 | 80 | 75 | 85 | 80 | | | 120 | 110 | 105 | 92 | 82 |
| Sep-03 | 85 | 75 | 85 | 80 | 85 | | 120 | 110 | 105 | 82 | 75 |
| Oct-03 | | | | | | | 116 | 96 | 82 | 61 | 48 |
| 3-Nov | | | | | | | | | 108 | 93 | 57 |
| Dec-03 | | | | | | | | | 88 | 72 | |
| Jan-04 | | | | | | | | | | | |
| Feb-04 | | | | | | | | | 105 | 85 | |
| Mar-04 | | | | | | | | | | | |
| Apr-04 | | | | | 95 | 90 | 135 | 120 | 110 | 100 | 80 |
| May-04 | | | | | | | 125 | 110 | 105 | 90 | 80 |
| Jun-04 | 80 | 70 | | | | | 126 | 105 | 95 | 77 | 72 |
| Jul-04 | 80 | 70 | | | | | 130 | 102 | 95 | 75 | 68 |
| Aug-04 | 85 | 80 | | | | | 137 | 102 | 92 | 75 | 73 |

Source: FICEN (pers comm.)

7. For carps in the Hanoi market, the retail price of Đ22,400 represented a markup of 59% on the farm gate price. For major carps, the markup was 62%. The margins for fish transported from distant provinces to major markets are higher, due to transport costs, though these are low by international standards. Marketing and transport margin for major carps from Nghe An sold in Hanoi were approximately 66%. Overall, marketing margins are low, suggesting a highly efficient marketing chain. Prices along the marketing chain in 2001 are given in table J-2.

Table J-2 Average price of major species in 2001
Đ'000 /kg

| | Product | Fish Farmers | Fishers | Wholesalers | Retailers | Processors |
|----|------------------|--------------|---------|-------------|-----------|------------|
| 1 | Dried fish | - | na | 28.2 | 34.8 | 16.15 |
| 2 | Dried squid | - | 77.2 | 96.6 | 116.0 | 153.3 |
| 3 | Fish sauce | - | - | 6.0 | 8.9 | 6.8 |
| 4 | Mackerel | - | 20.9 | 23.7 | 27.6 | 43.7 |
| 5 | Tuna (skipjack?) | - | 6.9 | 8.4 | 9.9 | - |
| 6 | Dried shrimp | - | - | 69.2 | 131.4 | - |
| 7 | Common carp | 13.9 | 11.4 | 16.0 | 18.5 | - |
| 8 | Snakehead | 15.2 | 13.0 | 20.4 | 22.8 | - |
| 9 | Grass carp | 9.2 | 7.6 | 11.6 | 11.7 | - |
| 10 | Scad | - | 7.1 | 7.1 | 7.9 | - |
| 11 | Pomfret | - | 17.1 | 20.4 | 24.5 | - |
| 12 | Anabas | 11.0 | 11.0 | - | 20.0 | - |

Source: Dang & Ruckes (2003)

Export Volume and Value

8. Export volumes and values over the period 1995 to 2001 are in Table J-3

Table J-3 Main Fisheries Export Products of Viet Nam

| Volume ('000t) | Frozen shrimp | Frozen squid | Fish | Dried squid | Other products | Total |
|-----------------------|---------------|--------------|-------|-------------|----------------|--------|
| 1995 | 66.0 | 7.2 | 25.0 | 5.5 | 0.0 | 103.7 |
| 1996 | 72.0 | 9.5 | 30.0 | 6.0 | 0.0 | 117.5 |
| 1997 | 65.7 | 24.3 | 37.2 | 10.6 | 68.7 | 206.4 |
| 1998 | 65.0 | 20.0 | 30.6 | 7.7 | 77.3 | 200.6 |
| 1999 | 61.3 | 21.9 | 36.4 | 10.0 | 100.3 | 230.0 |
| 2000 | 66.7 | 21.2 | 56.5 | 26.4 | 121.1 | 291.9 |
| 2001 | 87.2 | 21.1 | 74.1 | 18.1 | 175.1 | 375.5 |
| Value (\$ mil) | | | | | | |
| 1995 | 360.0 | 27.4 | 50.0 | 39.6 | 73.1 | 550 |
| 1996 | 381.6 | 39.9 | 66.0 | 45.0 | 117.5 | 650.0 |
| 1997 | 389.7 | 84.0 | 94.1 | 38.7 | 154.9 | 761.5 |
| 1998 | 449.0 | 70.4 | 78.6 | 40.4 | 179.7 | 818.0 |
| 1999 | 482.3 | 75.5 | 96.5 | 54.4 | 230.2 | 938.9 |
| 2000 | 654.2 | 82.4 | 165.8 | 211.3 | 364.9 | 1478.6 |
| 2001 | 777.8 | 80.7 | 221.9 | 153.8 | 543.2 | 1777.5 |
| Price (\$/kg) | | | | | | |
| 1995 | 5.5 | 3.8 | 2.0 | 7.2 | | 5.3 |
| 1996 | 5.3 | 4.2 | 2.2 | 7.5 | | 5.5 |
| 1997 | 5.9 | 3.5 | 2.5 | 3.7 | 2.3 | 3.7 |
| 1998 | 6.9 | 3.5 | 2.6 | 5.3 | 2.3 | 4.1 |
| 1999 | 7.9 | 3.4 | 2.7 | 5.4 | 2.3 | 4.1 |
| 2000 | 9.8 | 3.9 | 2.9 | 8.0 | 3.0 | 5.1 |
| 2001 | 8.9 | 3.8 | 3.0 | 8.5 | 3.1 | 4.7 |

Source: FICEN

9. Total export value was \$1.8 billion in 2001 and in 2003 reached \$2.2 billion. Shrimp contributed \$1.14 billion (52%). In 2004, export values are somewhat lower, and are unlikely to exceed 2003 levels. In 2000, Japan and other Asian markets dominated exports with 60% of the volume and value of exports (Table J-4).

Table J-4 Volume and Value of Exports by Market (2000)

| Volume (t) | 1997 | 1998 | 1999 | 2000 | |
|----------------------|--------|--------|--------|--------|------|
| Japan | 85302 | 69580 | 67226 | 68717 | 24% |
| US | 6098 | 10908 | 18933 | 37979 | 13% |
| EU | 20475 | 23081 | 21977 | 20290 | 7% |
| Asian (except Japan) | 86553 | 84830 | 99919 | 106779 | 37% |
| Other markets | 7969 | 12155 | 21908 | 58155 | 20% |
| Total | 206398 | 200556 | 229964 | 291923 | 100% |

Consumption

10. There have been a number of studies of fish consumption in Vietnam. FAO food balance sheets indicated that average consumption in Viet Nam increased from 13.2 kg/person in 1990 to 18.7 kg in 2000 (reported in Lem 2002?). Additional data can be drawn from

| Value (\$ mil) | 1997 | 1998 | 1999 | 2000 | |
|-----------------------|-------|-------|-------|--------|------|
| Japan | 382.8 | 357.5 | 383.1 | 469.5 | 32% |
| US | 39.2 | 80.2 | 130.0 | 301.3 | 20% |
| EU | 75.2 | 93.4 | 90.0 | 71.8 | 5% |
| Asian (except Japan) | 236.5 | 234.8 | 273.0 | 412.4 | 28% |
| Other markets | 27.8 | 52.1 | 62.8 | 223.7 | 15% |
| Total | 761.5 | 818.0 | 938.9 | 1478.6 | 100% |

Source: IFEP

the "Fish Marketing Study in Tien Giang province", carried out in 1999 and part of the project "Rural Extension for Aquaculture Development of Mekong Delta". Although this study aimed particularly at forecasting demand for

freshwater species, it also surveyed consumption of all fish products. Average fish consumption per caput for the province was estimated at 38.5 kg/year). Price elasticity for fish was estimated at -0.466 and income elasticity at 0.112 (ibid). An annual nutrition survey in 2000 reported annual consumption of 24kg/person nationally, ranging from 12kg per person in the north to a high of 33kg in the Mekong Delta.

11. Fish consumption was estimated through a wide ranging survey of 656 households under an FAO study by Lem (2002). The consumption estimates are high compared to other studies but are of interest as they confirm the importance of fish in the Vietnamese diet, with consumption of 2.8 times that of the other three protein sources combined. The report indicates that consumption of fish is lower in the northern provinces than in central and southern provinces. Consumption in the cities is lower than in both suburban and rural areas, a result that is common throughout the country and suggests inadequate distribution channels in urban areas or problems in logistics and marketing.

12. Surveys made by the National Institute of Nutrition from 350 households in Hanoi suburbs and Ha Nam Ninh province in 1989 indicated that daily consumption of protein on integrated farm (VAC) households is much higher than that of comparable groups (Nam et al, 1999).

Processing

13. The processing sector has expanded rapidly over the past few years, particularly with the development of large modern facilities particularly in the south in Khanh Hoa and most Mekong delta provinces. There are about 400 registered processing plants in Viet Nam with around 0.8 million tons input capacity. According to (Dang & Ruckes 2003) 77% of institutional consumers required “safe and hygienic food certificates”. Among processors, 74% had HACCP certification, 54% were Good Management Practice certified, 24% had EU certification while 16% were ISO certified. Of registered processing plants, 80% were in the south, 12% in the central and 8% in the north regions of Vietnam. By 2003, 100 enterprises and 8 mollusk production areas were certified for the EU market.

14. A majority of the plants process shrimp. Frozen shrimp exports were 56,000 tons in 2000, and have subsequently increased. Other products include swimming crab, snail, mud crab, oyster and scallop which in total contributed 77,200 tons to exports in 2000, or 26% by volume of total exports.

15. A total of 43 companies and many thousands of small enterprises process fish products for domestic markets with a total input capacity about 330,000t/year (Fisheries Master plan). Products include fish sauce, dried products, fishmeal and frozen and chilled products. Dried products are popular with small businesses as they are simple to make and do not require complicated facilities and technology. The main products are dried squid, fish, shrimp, seaweed (*Gracilaria*) and products dried with spices.

Export Market Impediments

16. As aquaculture products have made an increasingly important contribution to export value and trade in fishery products, Viet Nam has faced increasing problems with various international trade measures. Viet Nam has made substantial investment in upgrading the quality of its seafood processing factories, and HACCP and EU and Japan health and hygiene standards are now being widely adopted. Nevertheless, recent events and trends show that significant challenges remain for Viet Nam to be competitive in the international market for aquaculture products that go beyond processing plant quality control and processing technology. Aquaculture is likely to be the main supply for higher value exported aquatic products, therefore considerable investment in addressing trade-related constraints is needed to remain internationally competitive.

US Anti-dumping Measures

17. In part due to the great success in penetrating export markets, there have been a number of recent developments that have resulted in export bans or limits. Catfish were subjected to US anti-dumping legislation in 2002. Vietnamese exporters have been highly successful in identifying new markets for process catfish, which are now exported to more than 40 markets. Exports to Europe have increased by 250% since 2003 and to the Pacific region by 350%. The number of processors exporting catfish has increased from 16 prior to the introduction of tariffs to more than 30. The farmgate price of catfish in the Mekong delta has reached a record \$15,000/kg. Further information on the catfish dumping case is provided in Appendix G.

18. The proposed US shrimp anti-dumping tariffs (planned for imposition in China and five other countries as well as Vietnam), could cost exporters fines of between 12 and 93% of FOB value. The impact of this would be significant in the short-term, but many exporters look on shrimp as a commodity, and expect the markets to even out such pricing issues quite quickly. Further information on the shrimp anti-dumping case is in Appendix G.

19. There are no direct subsidies in the aquaculture industry. That is, there is no direct payment to farmers from the government for producing aquaculture products. Government infrastructure investment, (e.g., under Programs 327 and 773) can be seen as an indirect subsidy to the aquaculture industry. However, these programs are multipurpose in nature and the aquaculture industry is not the only beneficiary. Also, the government sponsored hatchery research and feed production programs are multipurpose and of such a small size they do not significantly subsidize the sector raising questions over the validity of the anti-dumping programs.

Market Development Issues and Constraints for Aquaculture

20. Apart from the anti-dumping measure, the shrimp farming sector in Viet Nam is being influenced by several macro-level market-related trends, including:

Trends towards lower farm gate prices

Increasingly stringent food safety and quality standards

Certification and trace-ability

Importing country awareness of social and environmental issues in shrimp farming.

- Vertical integration in the shrimp industry to control costs and risks

21. These aspects are discussed below on a preliminary basis, bring together current understanding of the implications of these trends for livelihoods of the stakeholders involved, and particularly for poorer stakeholders.

Food safety and quality

22. A major challenge faced by Vietnamese fisheries in relation to market access, especially to markets in the EU, followed by the United States and Japan, concerns food safety. Internationally, there is also an increasing trend towards trace-ability and application of HACCP at the *farm level* to reduce risks of contamination in the production process, particularly antibiotic residues. This raises significant challenges for all in the shrimp sector in Vietnam, but perhaps most to the many thousands of small-scale producers involved, connected to markets only by fragmented market chains.

23. While implementation of effective SPS measures in the shrimp sector will enable the country to remain competitive on international markets, the implications for poorer farmers could be significant. The implementation of HACCP and food safety management at farm level requires knowledge and skills and investment in infrastructure and extension. Poorest producers – due to limited human, social, financial assets - are likely to find it most difficult. The need to assure the quality of inputs and trace-ability and verification procedures may also make it difficult for anything

but the most organized input suppliers (feed and seed) to comply again putting at risk substantial numbers of people, for example in the shrimp seed business.

Certification and Eco-labeling

24. Certification of shrimp aquaculture products is slowly coming to the international scene, partly in response to food safety concerns, but more generally in response to consumer and NGO concerns over sustainability of shrimp farming. Certification is a relatively new concept for Vietnamese fisheries in general. At present, the Vietnamese government is pilot testing some certification procedures for food safety of shrimp aquaculture products from farms operating “Good aquaculture practice (GAP)”, learning experiences with the Code of Conduct and GAP programs from Thailand and elsewhere. The intention is to establish a wide coverage of a basic GAP program, with certification of shrimp product from certified farms by NAFIQAVED, the Government agency with designated responsibility for seafood certification. There is also a pilot organic shrimp certification scheme in southern Vietnam, with shrimp certified by the organic certifier “Naturland”. The scheme offers a 20% market price premium to farmers, with shrimp exported to Germany and Switzerland. Farmers and the State Enterprise in the Mekong delta involved in the scheme commented recently at a public meeting in Ho Chi Minh city (Organic aquaculture conference, organized by INFOFISH) that they would like to simplify the certification procedures, and be able to adapt the standards to allow for more intensive aquaculture (the system is confined to extensive farms, with limited stocking and no feeding, hence limited financial return to farmers).

25. A certification system will require substantial investments in farmer organization, support to implementing certification standards and a credibly organized certification system. Again, substantial knowledge and skills, financial assets, and access to institutions and services to support the certification scheme will be required. It is inevitable that poorer farmers will find it most difficult to participate in such schemes, unless substantial focused support on the small-scale sector is provided. Certification is a substantial challenge in Viet Nam where there are many thousands of farmers involved.

Environmental and social awareness in importing countries

26. Although food safety is probably the most significant issue influencing shrimp imports at the present time, there is evidence of increasing awareness of the environmental and social issues in importing countries and regions. Following a major campaign by a UK based NGO for example, UK supermarkets have been exploring accessing shrimp produced and processed in “socially responsible” ways. In the US, NGOs are increasingly targeting consumers with campaigns about the environmental and social implications of seafood. This appears to be slowly driving the industry towards certification, and industry assurance systems that address social and environmental issues.

27. Provided effective institutions can support better environmental management, there would be benefits to coastal people in Viet Nam because of its small-scale sector base. However, costs of putting place certification systems based around this concept may make it difficult. At the processing plant level, policies and support services that reduce the vulnerability of poor women and men may be positive, although with potential increased costs. Again, the least organized groups and individual farmers will find it most difficult to organize and implement systems.

28. All these trends point to increased vulnerability and difficulties for the small-scale coastal shrimp farmer, and point to the need for diversification of product away from the more risky shrimp sector to other products, as well as diversification of markets. Finally, the growth of demand for fishery products in China, and potential for competition with China is likely to have a significant influence on the demand and markets for Viet Nam’s fishery and aquaculture products.

Future Demand and Price

29. The population of Viet Nam in mid-2004 was approximately 83 million, and was growing at around 1.3% annually based on the UN's world population estimate for 2002. While child survival is approaching replacement rate (2.1 children per woman), the young population and increasing life expectancy mean that continued growth is inevitable, with a projected population of around 105 million by 2025. In addition to its population growth, Viet Nam's economy and thus disposable personal income levels are growing rapidly, with GDP increasing by an average of around 7% annually. The number of households living in poverty is falling rapidly, ensuring that the number of potential purchasers for fish and marine products will increase steadily. Health factors with increasing awareness of the beneficial impacts of fish consumption on heart disease, will also promote demand in Vietnam. All of these factors suggest that local demand for fish will grow strongly over the next decade at least. Given the large potential to expand freshwater culture, it is expected that production will more or less keep pace with demand for the next few years, suggesting average real prices will remain reasonably stable. However, given the reported inelastic demand, substantial short-term fluctuations are likely.

Price trends

30. Predicting export price is inevitably hazardous, since it depends on a range of factors and perceptions. In Viet Nam, processed shrimp is the dominant export product, and its price prospects are critical for the future viability of brackish water farms along much of the coastline. Globally, the farm gate prices of shrimp have shown a steady decline in recent years, most significantly in the past 3 years. This is in response to the increased global supplies, expansion of *P vannamei* farming in Asia (China and Thailand in particular) and recently uncertainties in the global market related to the US shrimp anti-dumping case. Prices are currently at a historical low, which is even more significant in real terms. There do not seem to be any factors leading to optimism about future prices, since production increases in Viet Nam are likely, while the US anti-dumping tariffs, if implemented, will reduce export price to that market. However, Viet Nam is a low cost producer, and should be able to weather market shocks better than some of its competitors (such as Thailand or China). Future demand for shrimp products is likely to grow, and this could be encouraged by improved brand naming and promotion of Vietnamese product. It is becoming harder to produce large shrimp from aquaculture, suggesting that in the medium term, price for larger shrimp (>40/kg) will increase or at least remain at about their present level, while downwards pressure is likely to continue on smaller sized shrimp.

31. The reduction in farm-gate price is already well recognized by farmers as a significant influence on their livelihoods. Lack of ability to negotiate prices with buyers and prices fixed with credit suppliers create additional vulnerability for farmers. The influence is most significant for indebted poorer farmers, reduces the capacity of indebted farmers to pay off existing debts (which are significant among some coastal shrimp farming communities), and will inevitably increase the likelihood of poorer farmers having to leave the industry. Poorer farmers tend to be at most risk from disease problems, due to limited skills, and ability to purchase quality inputs, compounding the risk. Small-producers also lack the ability individually to reduce input costs because of small volumes of purchase, and credit-relationships with input suppliers. As in the case of catfish, wealthier farmers may reduce expenditure on labor to reduce costs.

32. Combined with the increased investment in food safety and quality control systems, noted below, the price trend can be expected to have increasing implications for competitiveness of small-scale farmers. One option is to explore economies of scale and efficiencies in the small-scale farming sector through working together, probably through more organized cooperation or self-help groups of farmers. Without a concerted focus by government and industry on the small-scale sector, there may be serious social implications in coastal farming communities.

5. Export Barriers

8.1 EU Antibiotic Residue Issue

33. A recent major problem for shrimp aquaculture products occurred in 2001, when the EU detected banned antibiotics (chloramphenicol and nitrofurans) in imported shrimp from Vietnam, as well as other exporting nations in Asia. The problems emerged from use of new analytical techniques that allow detection of these chemicals at very low levels (they also have to be seen in the context of increasing consumer and government concern in the EU over food safety). The result was rejection and destruction of containers, and increased inspection, with EU examinations of 100 percent of shrimp products imported from Vietnam, as well as China, Thailand, and Indonesia and other countries during late 2001 and 2002. Containers with contaminated shrimp were destroyed, causing significant financial losses for some exporters. The export turnover from Vietnam into EU in the first 6 months of 2002 registered an 87% decrease compared to 2001.

34. On 20 September 2002, the EU Veterinary committee stopped the compulsory 100% examination policy on shrimps imported from Vietnam; the result of efforts by MOFI, VASEP, and exporting companies to raise awareness and control use of banned chemicals and antibiotics in the country. The problem has proved a complex one to control, as it relates the farm production system, lack of awareness among farmers, and easy importation and trade of chemicals from neighboring countries. There still exists a need to strengthen policy on the responsible use of chemicals in aquaculture, and further strengthening of quality control and food safety measures in aquaculture production.

35. In response to the EU problems, some exporters gave more attention to the apparently lower risk US market, which processors interviewed during the mission regarded as “less fickle”. This major expansion of exports destined to the US from 2001 to 2004 then created its own trade problems.

5.2 Antidumping Measures on Farmed Catfish

36. After an early but unsuccessful attempt to restrict imports by disallowing the name “catfish” on imports from Vietnam, the US Government through the International Trade Commission (ITC) under the United States Department of Commerce (DOC) received a petition from the Catfish Farmers Association and eight individual catfish processors in the United States demanding an anti-dumping investigation into the imports of certain Vietnamese frozen fish fillets (from catfish – now called tra and basa). The petitioners alleged that the Vietnamese frozen fish fillets were sold in the United States at less than its production value, and such imports were materially damaging the US domestic catfish industry. After its investigation in January 2003, the DoC ruled in favor of the US catfish industry, and levied a series of tariffs against Vietnam’s catfish exporters from 37% to 53%.

37. The decision had significant ramifications for the people involved in the catfish industry in the Mekong delta, particularly the most vulnerable. The most immediate effect was a decline in the farm-gate price of basa below production costs, and cost cutting measures by processing factories, leading to loss of employment among hired laborers on cages and ponds and processing factory workers (mainly women), some of the poorest people in the catfish market chain. It is estimated that in An Giang province alone the reduction of farm gate price led to a loss of more than VND 200 billion (US\$ 12 million). Taking into account this province produces half of the total production of catfish in Vietnam, it is estimated the antidumping decision caused an economic loss of US\$ 24 million to the catfish farming households in Vietnam. It is estimated that among small-scale farm households, laborers and people working in processing plants that 8,000 laborers lost their jobs and 10% or 500 workers lost their jobs from export-processing enterprises in An Giang province.

38. The influence of the US antidumping decision was significant, but local institutions and government policy addressed the problem with several strategies. Initial cost cutting was carried out by the enterprises and farmers, saving businesses, but leading to loss of employment among poorer

laborers and processing factory workers. Vigorous promotion by Government and processors resulted in significant increases in domestic consumption. This has led to significant increased consumption of catfish in Vietnam, to some extent reducing dependence on export markets. New export markets were opened in Europe and the Americas. By late 2003 and the first quarter of 2004, the tra and basa fish price had completely recovered to the prices seen before the antidumping case. There is new investment in the industry, including new processing factories. The Vietnamese catfish industry has not only sustained but also has developed further after the US antidumping decision.

5.3 Antidumping measures on farmed shrimp

39. Vietnam faces a new anti-dumping threat that may have a major impact on stakeholders involved in the shrimp industry that may be more difficult to address than catfish. This is the claim made by US Gulf of Mexico shrimp fishermen and farmers that a number of developing countries are dumping farmed shrimp in the USA market. The challengers are the “Southern Shrimp Alliance, an *ad hoc* group of shrimp fishers (mainly) and farmers. Their petition to the US International Trade Commission names Vietnam among the six developing countries that are globally all significant and low-cost shrimp farmers. Antidumping petitions were filed with the United States International Trade Commission (ITC) on 31 December 31 2003.

40. In a February 2004 decision, the United States International Trade Commission (ITC) determined that there is a reasonable indication that a U.S. industry is materially injured or threatened with injury due to the import of certain shrimp products from Brazil, China, Ecuador, India, Thailand, and Vietnam. The affected products include frozen and canned warm water shrimp and prawns that are allegedly sold in the United States at less than fair value. A preliminary antidumping determination was released in July 2004, with taxes of 12-93%.

41. Studies by Action Aid have warned of the social impact on many thousands of farmers, and workers as a result of the US antidumping measure. As in the case of catfish, the effects of an unfavorable decision in the US antidumping case will lead to substantial negative consequences for the many small-scale farmers and other stakeholders involved in the industry, and particularly the poor and vulnerable. Already, prices for shrimp are 10-15% lower in 2004, including both farmed and wild shrimp. Respondents during the mission also reported reduced prices, and reduced earnings of processing factory workers.

42. In both of the anti-dumping cases, Vietnam is at a disadvantage because it is not WTO member and therefore does not have access to the formal WTO mechanisms for challenging anti-dumping measures imposed on the country. Membership of the WTO should obviously put Vietnam in a better position for challenging anti-dumping cases.

Appendix K: Development Priorities and Follow-up Recommendations

The following lists the major recommendations arising during the Sector Study. This list provides the basis for the synthesis presented in Chapter 7 of the main report.

Marine Sector

A1 Inshore Fishing Effort Reduction

- Develop program to reduce fishing intensity on inshore stocks, particularly through support for sustainable alternate activities for poor fishing communities.
- Promote use of environmentally friendly gear, reduce fishing vessel numbers, support co-management.
- Develop alternative income options including aquaculture, agriculture, contracted works for coastal forest protection, and other off-farm livelihood development.
- Enforce push net and near shore trawl bans, dynamite, electric and poison fishing.
- Institute closed fishing seasons or seasonal gear restrictions.

A2 Offshore Fisheries Management

- While some provinces continue to support increasing offshore effort, it is generally considered that new boat construction should only be allowed if , for example, at least equivalent fishing effort is removed permanently.
- Improve stock assessment analysis capacity.
- Commence a compulsory logbook scheme for all vessels over, for example, 90HP.
- Introduce in conjunction with industry a license limitation scheme.
- Remove all subsidies and subsidized interest rates from all state fishing enterprises as quickly as possible.
- Continue and expand program of repossession of subsidized fishing vessels in default under the offshore fishing program.
- Develop rights based fishery
- Consider benefit and practicality of instituting closed seasons for catch in selected areas or for particular types of gear.

A3 Management Plans

- Tonkin Gulf fisheries are overexploited and require improved management. Initially conduct a Tonkin fisheries study and develop management plan (with China) including stakeholder involvement.
- Over time, develop management plans for all fisheries.

A4 Technology Development

- Conduct research into stocks and grounds.
- Develop and extend improved technology for sustainable management/harvesting of currently under-exploited resources should they be identified under the above research – deep-water demersals and meso-pelagics.
- Depending on the above, develop improved and more environmentally sensitive fishing gear – assess potential to separate fisheries into e.g., fish, shrimp and squid (and cuttlefish/octopus) with different gear restrictions for each. For example a 7.5 cm stretched mesh codend could be considered for fish, while limits on gear size might be merited for shrimp/squid (as in the northern Australian shrimp fishery). Promote use of bobbin trawls to protect benthic environment.
- Develop/improve monitoring system for vessel profitability (e.g., through ongoing ALMRV type surveys).

A5 Fishing Ports

Conduct national port planning study, to include major port definition.

Develop selected existing or new fishing ports as international standard ports to service offshore fleet, if needed based on the above study.

Study of estuary siltation and river mouth bar development in relation to use by fishing industry for mooring/unloading and typhoon protection.

Develop local typhoon protection shelters in typhoon-prone areas.

- Introduce private sector involvement in port management as required by a MOFI circular in 2004.

Inland fisheries

217. Inland fisheries are important sources of fish and other aquatic products for rural inland areas. There is evidence that they are of particular importance to some of the poorest landless people.

- Recognize the importance of inland fisheries for the poor.
- Assess the importance to the national economy and local farmers and poor inland fishers in reference to the trade-offs, particularly of flood control for agriculture.
- Identify of appropriate management measures such as appropriate gear and closed-fishing seasons in selected areas.
- Identify sanctuaries and establish management plans to protect key breeding and nurturing habitats to sustain or improve productivity and biodiversity conservation.

Aquaculture

218. Aquaculture development is required to meet the future demand for fishery products. It is also one of the few alternative livelihood activities available in coastal areas with potential to contribute significantly to poverty alleviation among inshore fishers. Government policy strongly supports aquaculture development, particularly as the visibility of the sector has increased with growing export earnings. National policy covers most of the major development issues in the sector. The priority now is to translate existing policy concerning aquaculture, including its role in poverty reduction and environmental management, and the new Fisheries Law, to effective implementation.

C1. Environment and Natural Resources

- Planning of coastal aquaculture should be conducted within the framework of integrated coastal zone management.
- Zones/areas should be designated for aquaculture within ICZM plans.
- In delta areas where ICZM will prove difficult, identify and designate areas/zones for aquaculture, taking account of environmental suitability.
- Include assessments of carrying capacity in planning for marine aquaculture development.
- Aquaculture development planning in coastal areas should adopt a more balanced approach, protected areas of high biodiversity value such as wetlands.
- Environmental rehabilitation projects should be initiated on degraded common property.
- EIA should be conducted for aquaculture projects and aquaculture development plans, and used to prepare local environmental management plans.
- Larger commercial coastal aquaculture projects make it increasingly urgent to apply effective EIA procedures in aquaculture projects.
- EIA should be used as the basis for development of environmental management plans for aquaculture projects and areas, with resources for follow up monitoring.
- Training and awareness raising should be conducted among government staff on EIA use on aquaculture, at central (MOFI, MONRE) and Provincial levels (DOFI, DONREs)
- The “early warning system on disease and environmental pollution” is an important initiative that should be supported with skilled staff, facilities and coordination (with MONRE and others).
- A national strategy for aquatic animal disease control should be prepared.
- Prepare legal documents to guide local administration in environmental management, planning and monitoring in coastal areas.
- Develop educational/training tools to build skills among local administrations and farmers in the environmental management of aquaculture.
- Support research on marine fish cage systems that are less damaging to the environment, particularly through better feeding practices and integrated marine aquaculture where cage culture is combined with seaweed, bivalve and holothurian farming

C2. Aquaculture Planning

- Aquaculture planning gives too much emphasis on infrastructure and land allocation, but not on capacity and organization, sources of investment and implementation. Budget allocations for aquaculture plans should be sufficient to include environmental and development of implementation plans, taking account of both short and long-term requirements for sustainable investment.

- Local government (district, commune) has responsibility for management of substantial areas of common property land in coastal areas. The options for use of this land should be carefully considered during aquaculture planning, and priority given to environmental restoration, such as mangrove rehabilitation or reclamation of estuarine fishery habitat.
- The new Fisheries Law provides for allocation of water areas for commercial purposes and use by local people. Marine farming is a new frontier in Vietnam, with significant potential. MOFi is recommended to develop regulations for allocation of water areas for aquaculture, in ways that balance the requirements for commercial investment in aquaculture, and the needs of local people.
- When leasing public land and water for commercial aquaculture development, financial mechanisms should be included to cover costs of investment in environmental monitoring and management in these plans.
- Planning of coastal aquaculture should give more emphasis on zonal planning, defining the areas suitable for aquaculture development, ideally within the context of integrated coastal zone management. Local management systems should be established within each zone, under the responsibility of local stakeholders (public and private), for coordinated management of the zones.
- Land allocation for rent and red book registration should include adherence to certain environmental criteria defined in aquaculture plans. Aquaculture should be restricted as far as possible to designated aquaculture zones. Aquaculture development outside of designated aquaculture zones should be subject to strict EIA procedures.
- Establish a licensing system for aquaculture farms within planned aquaculture areas/zones.

C3. Aquaculture Diversification

- Invest research in diversification of coastal aquaculture species and farming systems, with emphasis on low risk options particularly for coastal poor.
- Prepare a strategy to define investment and technical assistance needs for quality seed production as prescribed under Government Program 112 with emphasis on Government to maintaining aquatic genetic resources, at least for the short-term and the private sector role for mass seed production for aquaculture

C4. Poverty and Social Development

219. Poor people are major stakeholders in aquaculture and small-scale inland and inshore fisheries. The priority for the fishery and aquaculture sector in Vietnam is the effective implementation of government's policy for poverty reduction in the fishery sector - "Sustainable Aquaculture for Poverty Alleviation" (SAPA) strategy.

- Improving the poverty targeting of aquaculture planning by ensuring more effective participation of and consultation with poor in planning for aquaculture development at all levels.
- Support capacity building among Provincial and local staff to implement more effective poverty focused approaches to aquaculture.

- The new GoV program for poverty reduction among 157 poor coastal communes (106/2004/QĐ-TTg) represents an excellent opportunity for a targeted program of support to build capacity and alleviate poverty in coastal areas.
- More widespread communication for sharing of experiences in poverty reduction in the aquatic resources sector to promote more widespread adoption of better practices.
- Shrimp farming has been the major aquaculture intervention in coastal areas; the risks associated with shrimp farming make this form of aquaculture risky for poor people. More diverse less risky aquaculture activities should be investigated in coastal areas (e.g., mollusks, fish nursing, fish or crab culture)
- With growing commercial investment in shrimp farming, and other aquaculture, develop mechanisms for investments in the sector that benefit poor people but do not expose them to risk. This may involve for example contract farming, joint ventures, farmer group collaboration and other means of contributing equity.
- Ensure consideration of poverty issues in the further development of the regulations for implementation of the new Fisheries Legislation through participatory consultations with poor people.
- Ensure consultation and participation of poor people in aquaculture planning and policy development.

C5. Farmer associations and community organizations

- Support local farmer organizations to manage aquaculture zones/areas in coastal areas in collaboration with local government.
- Develop local service centers, preferably, in conjunction with existing local institutions to support local farmer groups, with facilities for environmental management, disease control, and access to information on markets, technology and management.
- Encourage cooperation between farmer groups and Provincial and National service providers, including research institutes, extension agents, and marketers.
- Based on the macro-policy and concept of local farmer groups, MOFi should develop guidelines to support the establishment of community-based management/co-management in aquaculture.
- MOFi should assign responsibilities, encourage and build capacity among Provincial and local authorities to promote community based management.
- Encourage participation of the private sector and farmer organizations in development of policy on aquaculture. VINAFIS and VASEP for example could be supported to take more responsibility for collaboration and organizing consultation among members.
- Create cooperation between local farmer groups and processors and markets.
- Undertake pilot projects to build experience in local farmer organization and services centers.

Processing and Marketing

- Improved branding of Vietnamese products is required to improve brand recognition and market loyalty.
- Research into state support for aquaculture is merited to assess whether there is justification for anti-dumping actions by foreign nations and, if so, what measures can be taken to remove the factors.
- Occupational safety and health (OSH) is a key issue in processing and requires intervention, perhaps in relation to shift length and working conditions (including mandatory break periods).
- Continue support plants to obtain HACCP and other export registration.
- Promote development/use of flake ice and alternative cooling systems, such as chilled brine, brine freezing etc for long-trip vessels. Initially conduct study.
- Privatize/equitize all state processing enterprises, including restructuring (and possible break-up) of the three state fishery holding companies.
- Develop local markets.
- The potential for local markets to support viable production has been highlighted with the local marketing campaign for catfish following the US anti-dumping action.
- Improve dissemination to farmers and fishers of market information.
- At present, little reliable information is available to producers to assist them to plan their activities and marketing.

D2. International trade

220. Farmers and other stakeholders are being exposed to increased risks as well as the rewards of international trade in aquaculture products.

- Vietnam can benefit from: (a) full attention to international market trends, such as in food safety; (b) improvements in the dissemination of relevant market trends to farmers and other aquaculture stakeholders; and (c) more effective engagement with international standard setting bodies, ideally also in collaboration with neighboring countries for a greater “voice”.
- Within government, clarify responsibilities for engagement in WTO, OIE, Codex and CITES and ensure that fisheries and aquaculture issues are properly considered.
- Awareness of food safety issues is increasing, but there is still limited awareness among many farmers about food safety risks and management of such risks. Future market trends towards trace-ability will pose severe difficulties for Vietnamese farmers/producers due to the many small-scale farmers, and fragmented market chains. Therefore, a comprehensive food safety program should be developed and implemented in the aquaculture sector.
- Mechanisms should be established to better disseminate market information to farmers/producers. Local authorities, including aquaculture and agriculture extension should play a more active role in provide marketing information.

- Low risk options for marketing of aquaculture products from small-scale, risk prone, farmers should be supported.

Information and Planning

B1 Statistical System and Research Reports

- Improve fisheries statistical system through unification of GSO and MOFI system as planned. However, ALMRV landing place survey outputs need to be continued and integrated into the system.
- Analysis should include landings of economically important species. The current system of aggregating all fish species precludes much use of the data for modeling purposes.
- Improve data on inland fisheries in the national statistical system.
- Research reports should be published as soon as produced and reviewed. Rapid circulation of information is critical to the orderly development of responsive fisheries (and aquaculture) sectors.

B2 Fisheries Planning

- Develop improved fisheries (and aquaculture) sector planning by strengthening capacity at provincial level.
- Support ICZ planning and management in selected provinces.
- Develop mechanisms for improved consultation with industry (e.g., with VINAFIS).
- Consider separation of VINAFIS into aquaculture and capture fisheries chapters and provide support to allow it to represent fishers in their consultations and negotiation with government in relation to fisheries management. To provide effective representation for fishers, VINAFIS needs to be wholly or largely independent of government for management and budget.

B3 Integrated Coastal Zone Planning and Management

- Potential for conflict between different coastal users such as inshore fishers, mangrove users, tourists, rice farmers, aquaculturists and urban and industrial developers, is growing as pressure on resources increases. It is timely to move towards an integrated approach for development of aquaculture, fisheries and other activities through ICZM. Based on the experience gained under existing projects, the concepts of ICZM should be extended to additional coastal provinces.
- Implement as many as practicable of the remaining 12 approved MPAs as soon as possible. Where co-management is implemented, consider establishing additional commune or province-level MPAs for stock enhancement through providing secure breeding and nursery areas for inshore fish species.

B4 Co-management

- Develop pilot co-management models for near-shore waters, aquaculture, reservoirs and fishing ports.
- Develop co-management processes in the offshore fishery, through supporting mechanisms for effective consultation between industry, research and government.
- Support fisheries law implementation by provinces. Provide training and planning support, using a participatory process where appropriate.

Fisheries Education, Training and Extension

221. The basic systems for research, education and extension have been established and strengthened in recent years. Key priorities for implementation of policy are:

F1 Education and Training

222. Since it is desirable to reduce the number of inshore fishing vessels and to limit the growth of offshore fishing effort, encouraging youths to enter marine capture fisheries may be undesirable. Nonetheless there is an urgent need to assist fishers to increase their skills.

- Encourage skippers, engineers and mates on offshore fishing vessels to upgrade their knowledge and skills. Encourage fishing crew to take vocational courses. Provide additional training courses in regional centers.
- Determine the need for developing fishing technology testing and analysis facilities or more reliance on outsourcing tests to another nearby country that has that equipment. The willingness of industry to pay for net development would need to be assessed and construction compared to the potential for use of regional facilities and/or computer simulation. It is possible that a regional facility could be developed, which might: (i) increase potential for grant funding; and (ii) improve usage and thus financial viability.
- Investment in vocational training should be given a higher priority to support building of capacity among local service providers and farmers. Farmers who have received technical training in aquaculture are better able to reduce risk and earn better incomes.

F2 Extension

- Support for extension activities in aquaculture should be further strengthened. Given the increasing number of aquaculture farmers, and limitations in government extension staff, there is a need for new approaches.
- Develop a comprehensive strategy for aquaculture extension.
- Promote user-funded extension, e.g., through supporting farm groups to engage technicians.
- Women are actively involved in fish culture, but traditional extension activities may not reach women. Ways to reach women would be to increase the number of female staff working in extension of projects, and specific invitations to women to attend training.

F3 Research

- Investment in research has increased substantially as the value of the aquaculture sector has increased. Further investment in research is required. There needs to be closer cooperation with the private sector in the setting of research priorities and the conduct of research.
- Most research is of a technical nature. More research should be directed towards social and economic aspects, and the small-scale sector.
- There is a need for better coordination of research programs, to better link research to farmer needs, to increase quality through making research applications more competitive and to continue to build research capacity.

F4 Credit

- Traditional agriculture loans are small compared to investment required for aquaculture. There is therefore a need to mobilize capital for the sector, in ways that do not expose poor farmers to increased risk, possibly through being trained and having a competency certificate accompany the loan applications.
- Promote local people's credit institutions, which have a good experience in other rural areas of Viet Nam. Local authorities might consider spending some savings from land leases to support credit for local people.
- Development of insurance mechanisms for farmers should be investigated as a potential way of managing risk in aquaculture.

F5 Communications and Collaboration

- At national and local levels there is a great need for exchange of management experiences and collaboration between different government and donor projects. Projects should therefore prioritize networking with key stakeholders.
- Communication and sharing of experiences among farmers and fisheries at local levels should be supported.
- Promote collaboration among Ministries (e.g., MOFI, MPI, MARD, MONRE, MOLISA, MOST) and Provincial Departments (DPI, DOFI, DOST, DONRE, DOLISA) to support coordinated management of aquatic resources and integration of fisheries within projects and activities in other sectors (e.g., consideration for aquaculture development in irrigation projects, integrated in rice farming).
- Promote coordination among donors working in the aquatic resources and related sectors.

APPENDIX L. RECOMMENDATIONS FROM MOFi STUDY REVIEW WORKSHOP – AUGUST 31, 2004

1. Introduction

1. Honorable Minister Dr. Ta Quang Ngoc of the Ministry of Fisheries opened and chaired the workshop to review the study teams findings and recommendations that took place on the morning of August 31, 2004 at MOFi. Dr. Ngoc emphasized economic and employment the importance of the sector to people of Vietnam. He also emphasized the importance of sustainable development and management of Vietnam's fisheries and aquaculture resources through addressing the challenges of (1) effective environmental management, proper planning, and the development of support infrastructure; (2) the need to promote fisheries development to improve food security and quicken poverty alleviation; and (3) decision making to assure stable productivity and sustainability of the sector.

Schedule

2. The workshop program was as follows:

| Time | Activities | Responsibility |
|-------------|---|--|
| 07:30-08:00 | Registration | International Cooperation Department |
| 08:00-08:10 | Introduction | Mr. Pam Trong Yen |
| 08:10-08:20 | Welcome Address | Dr. Ngoc, Minister of Fisheries |
| 08:20-08:40 | Mission Introduction | Mr. Ronald Zweig, Mission Leader |
| 08:40-09:10 | Presentation on findings and recommendations on marine fisheries sub-sector | Dr. Ha Xuan Thong |
| 09:10-09:40 | Presentation on findings and recommendations on marine aquaculture sub-sector | Dr. Le Thanh Luu |
| 09:40-10:00 | Comments | Team members |
| 10:00-10:30 | Coffee/Break | |
| 10:30-11:15 | Group discussion on findings and recommendations (Four groups – coastal zone management, fisheries, aquaculture, marketing) | All participants |
| 11:15-11:55 | Group presentations | Group Leaders |
| 11:55-12:10 | Wrap-up | Mr. Ronald Zweig, Mission Leader |
| 12:10-12:30 | Conclusion | Dr. Vu Van Trieu, Deputy Director, ICD |

Workshop Findings and Recommendations

A. Coastal Zone Management

The key needs for CZM include:

- (i) capacity building;
- (ii) improvements in coordination among stakeholders;
- (iii) formulation of strategic policies regulations and guidelines to strengthen capacity to improve CZM;
- (iv) awareness raising of the need and benefits of proper planning and management of coastal resources, including the establishment of marine protected areas and community involvement, responsibilities and rights in their management;
- (v) create lines and system of communications to foster information sharing; and
- (vi) focus on sustainable marine and aquaculture development.

B. Fisheries

The group identified the following problems and resolutions:

- (i) fisheries resources are declining rapidly, particularly in coastal areas;
- (ii) number of particularly small fishing boats continue to increase;
- (iii) support offshore fisheries resource assessment;
- (iv) investments needed in fisheries infrastructure;
- (v) safety for fishers needs to be improved;
- (vi) raise fishers' awareness of the fisheries law and regulations;
- (vii) fishing grounds need to be allocated;
- (viii) establish a center for coastal monitoring.

C. Aquaculture

The main recommendation s for aquaculture are the following:

- (i) base development on Decree 224;
- (ii) base aquaculture development using scientific principles;
- (iii) improve accuracy in reporting production by species;
- (iv) improve infrastructure of farms with regard to water supply and drainage systems; and
- (v) increase diversification of species cultivated;

- (vi) improve understanding of environmental and disease management and the linkages between them;
- (vii) improve quality and timely delivery of seed;
- (viii) expand aquaculture sector with focus upon poverty eradication;
- (xi) clarify terminology used to describe the characteristics of the sector;
- (x) priorities:
 - (a) promote poverty reduction with aquaculture;
 - (b) promote marine aquaculture;
 - (c) diversify brackish water aquaculture ;
 - (d) improve warning systems concerning disease pandemics and drops in environmental/water quality;
 - (e) apply FAO Code of Conduct for Responsible Fisheries;
 - (f) assure adequate credit is available to foster development; and
 - (g) examine development criteria to assure that they are reasonable and practical.

D. Marketing

The main findings of the marketing sub-group pertain to the content of the study report's Executive Summary and are the following:

- (i) the market for raw material developed spontaneously and not systematically in a responsive way to meet market demands;
- (ii) the domestic market has not been given enough attention with most emphasis on exports;
- (iii) the processing capacity needs to be developed based on market demand;
- (iv) mechanisms to improve prices to producers need to be explored through more competitive and improved direct access to markets; and
- (v) greater attention needs to be placed on understanding international market situation (e.g., greater market intelligence needed) to assure effective competition.

The main recommendations from the group are the following:

- (i) develop strategy for seafood production based on market demand;
- (ii) promote products of Vietnam and improve competition in international markets;
- (iii) build up market system including the wholesale sub-sector and brand naming of Vietnamese products;
- (iv) need new policy to develop efficient marketing system;

- (v) create a system to be able to trace aquatic products to the production source, especially for aquaculture, to help meet the needs to eliminate barriers; and
- (vi) donor assistance required to help develop and improve fish marketing in Vietnam.

List of Workshop Participant

| No | Names | Organization |
|-------------------------------|-----------------------|--|
| Government Agencies | | |
| 1 | Nguyen Thi Thu Hong | Expert - International Cooperation Department - Ministry of National Resources and Environment |
| 2 | Tran Thi Lien | Vietnam Agriculture and Rural Development Bank |
| Ministry of Fisheries | | |
| 3 | Ta Quang Ngoc | Minister for Fisheries |
| 4 | Pham Quang Toan | Secretary for Minister |
| 5 | Nguyen Van Thanh | Deputy Director of Aquaculture Department |
| 7 | Do Thi Thu Hong | Inspector of Fisheries Ministry |
| 8 | Nguyen Thi Kim Anh | Legislation Department |
| 9 | Nguyen Phuc Dong | Deputy Director of Colletive Economy and Private Economy Department |
| 10 | Vu Thi Anh Hong | Nafiqaved |
| 11 | Nguyen Thai Phuong | VASEP |
| 12 | Nguyen Long | Deputy Director of Research Institute of Marine Products |
| 13 | Bui Van Thuong | Vice General Secretary of Vietnam Fisheries Associate |
| 14 | Nguyen Duy Chinh | Deputy Director of Institute for Fisheries Economic and Planning |
| 15 | Pham Tuyet Nhung | Deputy Director of Informatics Center |
| 16 | Ha Xuan Thong | Director of Institute for Fisheries Economic and Planning |
| 17 | Vu Van Trieu | Acting Director General of International Cooperation Department |
| 18 | Doan Manh Cuong | Expert - International Cooperation Department |
| 19 | Do Duy Con | Deputy chief of Ministry Cabinet |
| 20 | Tran Van Quynh | Director of National Fisheries Extension Center |
| 21 | Tran Thi Mieng | Deputy Director of Planning and Finance Department |
| 22 | Ngo Duc Sinh | Deputy Director of Department of Personnel |
| 23 | Nguyen Xuan Ly | Director of Science and Technology Department |
| 24 | Nguyen Thi Hong Nhung | VASEP |
| 25 | Dinh Ngoc Anh | Deputy chief of Ministry Cabinet |
| 26 | Vu Van Tien | Ministry Cabinet |
| 27 | Le Thanh Luu | Director of Research Institute for Aquaculture I |
| 28 | Nguyen Ngoc Oai | Deputy Director of The National Directorate of Aquatic Resources Exploitation and Protection |
| 29 | Pham Trong Yen | Deputy Director of International Cooperation Department |
| 31 | Le Thi Van Anh | International Cooperation Department |
| 32 | Dang Thai Hung | International Cooperation Department |
| Provincial Departments | | |
| 33 | Diep Thanh Hai | Deputy Director of Ca Mau Fisheries Department |

| | | |
|---|--------------------|---|
| 34 | La Chau Trinh | Deputy Director of Binh Thuan Fisheries Department |
| 35 | Nguyen Ngoc Phuong | Deputy Director of Kien Giang Fisheries Department |
| 36 | Quach Thanh Son | Head of Planning Office, Khanh Hoa Fisheries Department |
| 37 | Dau Van Cuong | Deputy Director of Hai Phong Fisheries Department |
| 38 | Tran Dang Tuan | Deputy Chief of Fishing Management Office - Nghe An Province Fisheries Department |
| 39 | Nguyen Quang Diep | Director of Quang Ninh Fisheries Department |
| 40 | Le My An | Deputy Chief of Planning Office - Thanh Hoa Fisheries Department |
| Projects and International Organizations | | |
| 41 | Karl Johanstaehr | Senior Advisor of ALRMV |
| 42 | Lars Joker | Coordinator of FSPS |
| 43 | Erling Bendsen | FSPS |
| 44 | Don Griffiths | Senior advisor of SUFA |
| 45 | Ronald Zweig | World Bank |
| 46 | Jon Cook | World Bank |
| 47 | Nguyen The Dzung | World Bank |
| 48 | Laurent Msellati | World Bank |
| 49 | Tran Trong Chinh | Norwegian Embassy |
| 50 | Ragna Fidjestol | Norwegian Embassy |
| 51 | Pham Gia Truc | FAO |
| 52 | Irmen Mantingh | FAO |
| 53 | Bui Thi Thu Hien | IUCN |

Appendix M. Recommendations from the MOFi Workshop on 10-Year Investment Priorities for the Sector-- October 28, 2004

A. Introduction

1. Honorable Vice Minister Dr. Nguyen Viet Tang opened the meeting with a welcoming address that defined the objectives and expected outcomes of the workshop. To start, he defined the importance of fisheries and aquaculture to the national economy with regard to food production, employment generation, poverty reduction and export earnings. There has been a steady increase in yield of fisheries and aquaculture production with the 2004 output expected to reach 1.2 million tons from fisheries and 700,000 tons from aquaculture. The development has been through a government partnership with local stakeholders, governments and the international donor community. However, it has become evident that the near-shore fishery has generally become over-exploited with little scope as well for further expansion and increased exploitation of the offshore fishery. For aquaculture in general, there is great potential with increased production as well as employment generation and poverty reduction through further investment in this sub sector; however, it has become clear that careful planning is required to mitigate and minimize the adverse environmental impacts that can result from unregulated expansion of aquaculture. Also, for aquaculture, the quality of the cultured organisms with regard to growth efficiency, nutritional value, and disease resistance are critical aspects that require more attention in Vietnam. Moreover, general inland and coastal area management plans are critical to achieving integrated co-management strategies that can assure sustainable and optimal economic benefits from those resources. Production thus needs to be better managed in a carefully structured manner for the long assure that the Vietnam can fully benefit from the use of these resources for the long-term.

2. Dr. Tang expressed MOFi's appreciation to the World Bank for providing the assistance for the study and the workshops to review the team's findings and to provide guidance on the way forward. He indicated that the workshop should focus on formulating a strategy that can help advance the Ministry and nation's management and utilization of fisheries and aquaculture resources through identifying investment priorities over the next ten years. Generally, the investment priorities identified in the Executive Summary and Appendix K of the report formed a good basis from which to work to complement the ongoing programs in the country and to advance the objectives of those programs. Toward this end, he also identified the need to form new policies that can support sustainable resource use with the main objective of reducing poverty in an environmentally sustainable and socially acceptable manner.

B. Schedule of Workshop

3. The schedule of the workshop at which there were 72 participants (see list below) was the following:

| Time | Activities | Responsibility |
|-------------|--|---|
| 08:00-08:30 | Registration | ICD |
| 08:30-08:40 | Introduction | Mr. Pham Trong Yen |
| 08:40-09:00 | Welcome address | Dr. Nguyen Viet Thang MOFI Vice Minister |
| 09:00-09:20 | Mission introduction | Mr. Ronald Zweig, Bank Team Leader |
| 09:20-09:40 | General WB policy and overview of the implementation of WB funded Projects in VN Agriculture and rural development sector -- some lessons learned | Dr. Cao Thang Binh (WB) |

| | | |
|-------------|--|--|
| 09:40-10:00 | Priority for Investment in the on-going on fisheries | Mr. Nguyen Huu Khuong Planning and Accounting Department |
| 10:00-10:20 | Tea break | MOFI Cabinet |
| 10:20-10:50 | Review of mission on fisheries status and recommendations of the last workshop | Dr. Le Thanh Luu |
| 10:50-11:00 | Group division | Dr. Vu Van Trieu |
| 11:00-12:00 | Group discussion on fisheries and aquaculture status | Groups |
| 12:00-13:30 | Lunch (Trade Hotel) | MOFI Cabinet |
| 13:30-15:00 | Group discussion on investment priority | Group leaders |
| 15:00-15:30 | Coffee/Break | MOFI Cabinet |
| 15:30-16:30 | Group Presentation and orient discussion | Group leaders |
| 16:30-16:40 | Wrap-up | Mr. Ronald Zweig |
| 16:40-17:00 | Conclusion | Dr. Nguyen Viet Thang |

C. Workshop Findings and Recommendations

4. The workshop participants broke into three working groups – I. Integrated Coastal zone Management and Fisheries, II. Aquaculture, and III. Institutions and Markets. The specific comments and opinions from each working group were the following:

Group I: Integrated Coastal Zone Management & Fisheries

A. Acceptance of the report

Structure:

- Combine two parts of the report: capture fisheries & aquaculture
- Fisheries and aquaculture is freely developed, without any master plan or lack of control capacity of local authorities.
- Lagoons in central Vietnam are important but have not been mention in the report.
- MPA is important, but should be carried out by the integrated approaches.
- Consideration of ICM as the main activity in fisheries is not proper.
- Awareness is important for fishermen and for local stakeholder.

Inland fisheries:

- Inland resources play an important role. Inland fisheries resources involve trans-boundary issues and depend on the environmental condition. Co-management of inland fisheries is important are affected by developments such as hydro-electricity and flood-control projects.
- Upstream issues, especially as they affect the Mekong Delta need to be addressed.
- Guidelines and regulations for resource protection are necessary such as the construction of hydro-electricity plants that should consider solution for migration of fishes.
- Strengthening awareness of fishermen on sustainable use of resources should be emphasized rather than the fishery law.

Integrated Coastal Management

- ICM is a new and requires an intensive coordination among interest groups. ICM is still implemented separately among the involved stakeholders without any master plan. This is a constraint for development of ICM. Nevertheless, ICM is urgently needed for proper resource management.
- As part of capacity building, detailed information is needed on the actual situation.
- Regarding the reduction of fishing effort, alternative livelihood options are required for local communities.
- MPAs should be considered as a high priority in fisheries. There is no doubt about the significance of MPA establishment.
- Emphasis should also be placed in Vietnam in implementing international conventions to which it is a party.

II. Projects and Priorities

- Projects are needed to convert livelihood of fishermen in coastal areas to alternatives from fishing, especially for small-scale fisheries. These are very common difficulties in almost all coastal provinces.
- Job conversion from fisheries to aquaculture is needed for fishers.
- Difficulties exist in the management of small-scale fishing fleets. Fisheries management should be delegated to local authorities to improve management capacity of fisheries.
- Fisheries development plan should also include islands, especially in Khanh Hoa.
- There are inconsistencies in fisheries management due to a lack of a long-term plan. Therefore, there is a need to have a master plan for long-term development purposes.
- Infrastructure needs for fisheries should also include those needed for inshore fisheries.
- Training for fishermen should be provided to improve the awareness of managements and sustainable uses of fishery resources.
- MPAs should be established for resources protection.
- Inconsistencies in policies at the local level are main reason for unplanned fisheries development. There is a need to apply integrated management and legislation. It is agreed that conversion of livelihood should be high priority.
- For integrated resource management, there is a need to assess the status of resources, economic activities, and actual use of resources to find out the solution for development.
- Emphasis should be placed on the role of local authorities.
- There is a need to assess the inshore resources. This has been implemented, but it is inadequate.
- Trawl and light purse seines are important and contribute a lot to production. If these fishing fleets are reduced, the conversion of fishermen livelihood will be a major and urgent requirement.
- Increase the labor quality in fisheries.
- Strengthen the research capacity in resource assessments and fishing technology.
- Foster the recovery of inland and marine fisheries resources.
- We should limit the priorities in term of WB support. We may apply the development model from China funded by WB.
- In general, there is a lack of integrated management in Vietnam. A focus on integrated management is suitable for development. It can play an important role in poverty reduction and environment protection.
- Include the support for livelihood development within the ICM program.
- MPAs should be managed by local authorities.
- The three-priority areas should be ICM, MPAs, and co-management.
- There is a lack of sufficient information for effective planning and management.
- There is an urgent need for routine data collection on fisheries and marine resources, both inshore and offshore area.

- Consider the support for community-based management for more MPAs (e.g., at provincial and district levels) in addition to the MPA system of 15 MPAs identified by MOFi.
- Credit is needed for job conversion.
- Develop marine cage culture, especially around islands.
- Reorganize the offshore fisheries.
- Support for MPAs should not be the main activities in fisheries.
- Recover the resources in reservoirs should be given high priority.
- MPAs should not be developed with investment from WB.

Group II: Aquaculture

I. Acceptance of the report

- The working group accepted the report, although suggested more emphasis be placed on the need for investment in water supply and drainage systems for aquaculture.

II. Projects and Priorities

5. The working group raised the following points:

- The need to prioritize investments in locations suitable for aquaculture, with potential to produce high volume production for market.
- Coastal areas should be given priority, due to poverty, the need to find alternative livelihoods for inshore fishers, and good potential for further aquaculture development.
- Mekong delta provinces are also a priority for further investment in aquaculture due to the high potential of this region.

Specific investment needs:

- Water supply and drainage systems for aquaculture in coastal and freshwater areas. These should be designed to meet the special requirements for each province/region. The group emphasized strongly – a point emphasized by Dr. Thang - the need for parallel investment in human resources and local capacity for management (i.e. not only construction and infrastructure).
- Aquatic seed production. Both public and private sector investment is required.
- Environment and disease monitoring systems – mostly considered responsibility of the public sector.
- Human resources and systems for co-management in designated aquaculture areas and reservoirs.
- Aquaculture and fishery development in reservoirs. Reservoirs are considered as important for poorer people displaced in reservoir construction. Emphasis in reservoirs should be on development of co-management systems.

- Aquaculture zones for production of “safe” aquaculture products and development of quality assurance systems. An integrated approach should be used to invest in aquaculture farming zones, including seed/feed, grow-out ponds, water irrigation systems, environmental and disease monitoring, and market development. This would involve public investment (major infrastructure), private investment (individual farms/ponds) and grants (training, development of co-management systems).
- Build capacity for extension network and develop infrastructure for extension and provincial fishery associations and service centers. This would involved mainly technical assistance (grant), but investment by government to develop local service centers and farmer associations
- Investment should be based on essential needs of each province. A specific project is needed for each province based on detailed consultation within each province to develop these projects.
- Give more attention to insurance in the aquaculture sector. (Note: an aquatic resources protection fund has been recently established).

III. Next steps – action, timing and responsibilities

- Ministry of Fisheries is responsible for appointing task force group to be in charge of the necessary steps, materials and information for formulation of a World Bank project.
- Request assistance from World Bank for project formulation and training and human resource development to develop and manage project (2005-2006).

Group III: Marketing, processing and institutional needs

I. Acceptance of the report

6. Generally, it is good:
 - It reports the socio-economic characteristic and international acceptance of Vietnamese fisheries.
 - Report has analyzed the difficulties in Vietnamese fisheries.
 - Given priorities for investments
7. However, some items/aspects need to be improved:
 - Report has not clarified small-scale fisheries in inshore area, multi-species fishery, and multi-species fisheries at small household level. These should be considered carefully for planning.
 - Vietnamese fisheries are spontaneous, sensitive with high risks and low competition capacity.
 - Management capacity and legislation system are still weak, and there are still difficulties in putting management and legal systems into practice.
 - Skills of fishery labor are still low.
 - Some data in the report are not presented in a standard way, which makes comparisons difficult. Also, data available in the country is generally weak affecting capacity to make informed decisions.

- Report has not mentioned the co-ordination among management steps, both large and small scale. It is important to identify management weaknesses and to strengthen them. Current policies are not applied uniformly.

II. Projects and Priorities

- Agree with trend of investment include in the report:
 - Integrated coastal management (ICM)
 - Fisheries managements
 - Diversification of aquaculture developments.
 - Markets
8. In addition, the group suggests the following priorities:
- Investment for human resources development, both management and technical skills. Only with capacity building will we be able to improve the quality of aquaculture products and market options.
 - Investment for fisheries resources assessment, include fisheries resources, species, area, human resources, market, technical issues, as a basic requirement for planning.
 - Look at diversification of processing plants. For example, after the tra and basa antidumping case, fishery officers were dynamic in accessing other markets (This comes from the presentation by Tuan - I think the point here is that when pressed people respond well). Now officials in Vietnam are very inexperienced with co-management.
 - There is traditional, local ownership of resources, and this tradition provides a basis for further development of co-management systems.
 - Fisheries information is limited, and improvements are needed for effective management.
9. On policies:
- There is a need for more study on policy effectiveness and institutions, as the basis for revision of policies.
 - There is no strong link between policies at central and provincial levels.
 - There should also be more consultations/exchange of experiences between provinces.
10. Another important area is the development in use of information technology (IT) for fisheries management. Training in IT should be provided.

D. Summary of Investment Priorities and Final Remarks

11. Dr. Nguyen Viet Thang summarized the outcome of the workshop at its conclusion. In general, he agreed and supported the priorities identified through the study and the conduct of the workshops. The key point is that there needs to be a balance between the technological and management aspects of fisheries and aquaculture development in Vietnam. This should be further complemented with an emphasis on achieving the government's objective of poverty reduction through direct engagement of inland rural and coastal poor in the sector to the degree possible to provide them with adequate income generating options.

12. Conservation of resources should be a key element of both fisheries and aquaculture development. From a development standpoint, it is also critical to consider the infrastructure needs while at the same time rationalizing production within an environmental management context,

including working within carrying capacity limits of the area being exploited under fisheries or for aquaculture development supported by effective environmental monitoring.

13. It is correct to put coastal zone management as the first development priority. It is important to focus more on sustainable resource management. The main challenge is to identify how best to solve the problem and to improve management.

14. With regard to production, nearly all or about 98% of development should be done by the private sector, allowing market mechanisms to determine the development direction. Therefore, good market intelligence with a long-term view is critical with diversification a key element in the consideration of expanded production. Concerning the challenges posed by importers on exports from Vietnam, the exporters should unite deal with this issue.

15. Another key element is to strengthen technical, environmental management, and marketing capacity in the fisheries and aquaculture sector. Educational and training programs should be supported to improve these aspects and address the challenges facing the sector.

16. To achieve the above goals, Dr. Thang endorsed the setting up of a working group under MOFi's International Cooperation Department. He also requested that the World Bank provide more detail on what would be required for the formulation of an investment operation for the sector that can be focused on achieving the above objectives in the program that would start at a relatively modest size from which experience can be gained for subsequent adjustment and expansion of the investment. He also encourages the local governments to be directly involved in the formulation process and implementation of the investment. Toward this end, Dr. Thang requested that training be provided on World Bank procedures.

E. Workshop Participants

| No | Name | Organizations |
|------------------------------|---------------------|--|
| Government Agencies | | |
| 1 | Hoang Xuan Huy | Expert - International Cooperation Department, Ministry of Nature Resource and Environment |
| 2 | Hoang Viet Khang | Deputy Director of External Economic Relationship, Ministry of Plan and Investment |
| 3 | Nguyen Lan Anh | Expert, International Financial Institutions division, Ministry of Finance |
| 4 | Nguyen Van Thuy | Expert, Preparing for Irrigation Investment Board, Ministry of Agriculture and Rural Development |
| Ministry of Fisheries | | |
| 5 | Nguyen Viet Thang | Vice Minister |
| 6 | Vu Dung Tien | Aquaculture Department |
| 7 | Nguyen Thi Kim Anh | Legislation Department |
| 8 | Nguyen Van Diep | Director of Collective Economic and Private Economic Department |
| 9 | Nguyen Van Chiem | The National Directorate of Aquatic Resources Exploitation and Protection |
| 10 | Nguyen Van Chau | Director, The National Directorate of Aquatic Resources Exploitation and Protection |
| 11 | Nguyen Hong Mai | The National Fisheries Quality Assurance and Veterinary Directorate |
| 12 | Le Thanh Luu | Director, Research Institute for Aquaculture No 1 |
| 13 | Nguyen Van Trong | Vice Director, Research Institute for Aquaculture No 2 |
| 14 | Nguyen Hung Dien | Director, Research Institute for Aquaculture No 3 |
| 15 | Do Duc Hanh | Fisheries Magazine |
| 16 | Ha Xuan Thong | Director, Institute for Fisheries Economic and Planning |
| 17 | Nguyen Chu Hoi | Deputy Director, Institute for Fisheries Economic and Planning |
| 18 | Cao Le Quyen | Institute for Fisheries Economic and Planning |
| 19 | Nguyen Viet Nghia | Deputy Chief of Marine Resource Section, Research Institute of Marine Products |
| 20 | Le Van Thang | Vice Rector of Fisheries College No 4 |
| 21 | Thai Thanh D- ng | Director of Informatics Center |
| 22 | Vu Van Trieu | Acting Director General of International Cooperation Department |
| 23 | Nguyen Huy Dien | Deputy Director of National Fisheries Extension Center |
| 24 | Nguyen Van Nam | Deputy Director of Department of Personnel |
| 25 | Do Van Nam | Expert of Science and Technology Department |
| 26 | Nguyen Hoai Nam | VASEP |
| 27 | Pham Van Nghia | VASEP |
| 28 | Bui Van Thuong | Vice General Secretary of Vietnam Fisheries Associate (VINAFIS) |
| 29 | Ho Thi Thu Hien | Vietnam Fisheries Associate (VINAFIS) |
| 30 | sinh Ngãc Anh | Deputy chief of Ministry Cabinet |
| 31 | Nguyen V'n Tien | Ministry Cabinet |

| | | |
|-----------------------------------|--------------------|--|
| 32 | Vu Tuan Cuong | Ministry Cabinet |
| 33 | Do Duy Con | Ministry Cabinet |
| 34 | Nguyen Quang Huy | RIMP |
| 35 | Nguyen Van Nguyen | RIAI |
| 36 | Pham Trong Yen | Deputy Director, International Cooperation Department |
| DOFI & DARD | | |
| 37 | Diep Thanh Hai | Deputy Director of Ca Mau Fisheries Department |
| 38 | Do Thanh Do | Deputy Director of Binh Thuan Fisheries Department |
| 39 | Nguyen Ngoc Phuong | Deputy Director of Kien Giang Fisheries Department |
| 40 | Dao Cong Thien | Director, Khanh Hoa Fisheries Department |
| 41 | Tran Cao Muu | Deputy Chief of Fishing Management Office - Nghe An Province Fisheries Department |
| 42 | Nguyen Quang Diep | Quang Ninh Fisheries Department |
| 43 | Le My An | Deputy Chief of Planning Office - Thanh Hoa Fisheries Department |
| 44 | Ha Van Tra | Head of Planning and Investment Office, Ha Tinh Fisheries Department |
| 45 | Nguyen Van Hieu | Director, Ben Tre Fisheries Department |
| 46 | Tran Van Chuong | Vice Director, Thua Thien - Hue Fisheries Department |
| 47 | Nguyen Van Thanh | Vice Director, An Giang Agriculture and Rural Development Department |
| 48 | Ly Ba Quang | Head Deputy of Technical Office, Hanoi Agriculture and Rural Development Department |
| 49 | Bui Luong Nhuan | Director of Thai Binh Agriculture and Rural Development Department, Member of Standing Committee Vietnam Fisheries Associate |
| University | | |
| 50 | Nguyen Anh Tuan | Vice Director, Can Tho University |
| 51 | Tran Danh Giang | Head of Training Office, Nhatrang Fisheries University |
| International Organization | | |
| 52 | Nguyen Phuong Lien | DANIDA |
| 53 | Niels Svennevig | SINTEF, NORWAY |
| 54 | Michael Akester | Senior advisor of SUMA |
| 55 | Ronald Zweig | World Bank |
| 56 | Michael Phillips | World Bank |
| 57 | Cao Thanh Binh | World Bank |
| 58 | Tran Trong Chinh | Norwegian Embassy (NORAD) |
| 59 | Ragna Fidjestol | Norwegian Embassy |
| 60 | Pham Gia Truc | FAO |
| 61 | Irmien Mantingh | FAO |
| 62 | Misha Coleman | ACIAR |
| 63 | Nguyen Minh Thong | IUCN |
| 64 | Nguyen Hoai Chau | Action Aid |
| 65 | Nguyen Song Ha | STEAM - NACA |
| Mass Media | | |
| 66 | Trinh Thuy Lien | Enterprise Newspaper |
| 67 | Nguyen Duc Thuat | Ha Noi Moi |
| 68 | Nguyen Cam Van | Labor Newspaper |

| | | |
|----|------------------|--------------------|
| 69 | Tran To Nhu | Vietnamnews |
| 70 | Nguyen Lan Huong | Ha Noi Moi |
| 71 | Ngo Mai Huong | Today Agriculture |
| 72 | Nguyen Thuy Hien | Vietnamnews Agency |

Note: Most of Participants also joined the August 31, 2004 Workshop.

