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Technical Note

Vietnam: Engagement of Poor Fishing Communities in the Identification of Resource Management and Investment Needs

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ABBREVIATIONS

AA	**Aquaculture Association**
AFFS	**Aquaculture Farmers' Field School**
BMPs	**Better Management Practices**
BSP	**Bank for Social Policies**
CDI	**Center for Development and Integration**
CPC	**Commune People's Committee**
DARD	**Department of Aquaculture and Rural Development**
DOFI	**Department of Fisheries**
EIA	**Environment Impact Assessment**
EU	**European Union**
FA	**Fishing Association**
FAO	**Food and Agriculture Organization**
GAPs	**Good Aquaculture Practices**
GESAMP	**Group of Experts on the Scientific Aspects of Marine Environmental Protection**
ICZM	**Integrated Coastal Zone Management**
IFAD	**Internatinal Fund of Agricultural Development**
MFI	**Micro Financial Institute**
MONRE	**Ministry of Natural Resources and Environment**
MPAs	**Marine Protection Areas**
NGO	**Non-Governmental Organization**
OASIS	**One-stop Aquaculture Supplies & Information Shops**
PPCs	**Provincial People's Committee**
RIA	**Research Institutes for Aquaculture**
SUMA	**Support to Brackish Water and Marine Aquaculture**
TNA	**Training Need Assessment**
UNDP	**United Nations Development Program**
VAPEC	**Vietnam Asian-Pacific Economic Center**
VBSP	**Vietnam Bank for Social Policies**
WB	**World Bank**
WTO	**World Trade Organization**

Executive Summary

Poverty issues: situation and trends

All communities in the survey (both inland and coastal) represent poor hamlets/communes, with a high incidence of poor households: 61% in Vinh Tuong hamlet (Ninh Thuan), 52% and 42,6% in Thach Hai and Tuong Son hamlets (Ha Tinh) respectively, over 23% in Hiep My Dong and My Nam Long hamlets (Tra Vinh)[1]. Progress with poverty reduction has been slow in these communities. Kinh people are the majority as compared with other ethnic groups in surveyed communities; only 2 communes in Quang Ninh (Duong Hoa and Quang Dien) have a small number of ethnic minority people such as San Diu, Tay, Nung, Chinese; a large number of ethnic Khmer was observed in My Long Nam and Hiep My Dong communes in Tra Vinh Province.

Resource utilization and how the fishing communities access resources:

<u>For coastal communities</u>*: The off-shore fishing productivity level in many areas does not indicate a significant decrease*[2]. Only better-off fishing households are able to access offshore resources. Poor fishing households in surveyed hamlets/communes are unable to do so, since they cannot afford adequate fishing equipment and vessels. Nevertheless, catches of offshore resources are not stable in many areas. *Although the fisherfolks still use explosive fishing method which damages species, the near-shore resources have decreased.* Some households access inshore resources mainly, for example, by diving to catch lobsters and sea snails, using fishing nets close to shore (Ninh Binh, Ha tinh), alga and *glacilaria* picking (in Ninh Thuan), and fish and squid catching (in Ha Tinh, Quang Ninh, Ninh Binh). Poor households have little or no capacity for exploitation of areas for aquaculture such as: farming of shrimp/prawn, fish, snail, seaweed cultivation, due to limited capital stock, techniques and management skills. The poor fisherfolks also pointed out that they could not undertake near shore or brackish fishing because the water surface either belongs to the State or Army or is being tendered at such a high price that only the better-off could bid. (Ninh Binh, Ninh Thuan). The sea surface also belongs to the provincial authority, and is not delegated to the district or commune authorities, so that the poor can neither obtain information nor access bidding procedures.

[1] In Tra Vinh, there was high poverty rate, (the poorest earn 122,000VND permonth compared with the average poor of VND200,000 capita per month) which is defined by MOLISA, Aug 2005. The consultation shows the poverty was constituted by shortage of lands , or no land tenure, lack of knowledge on production, low land fertility

[2] Hatinh, in Thach Ha district off-shore fishing productivity show stable from 21,170 tons (2001) to 21,050 tons (2005), but Can Loc district in Hatinh shows gradually decrease (225 tons in 2000 to 185 tons in 2005) , Ninh Binh 2,075 tons (2005)

For inland communities (using freshwater): Most poor households in surveyed areas rely on agricultural activities that have little potential to generate adequate income. Poor households' access to resources for aquaculture (freshwater fish, frog, tortoise, sweet snail) is also very limited due to lack of capital and access to markets (Ha Tinh). Most of those poor people work in non-farm, low-pay jobs. In some areas the poor can be involved in aquaculture exploitation because they have land to convert to lagoons/ponds (Ha tinh). But in many cases aquaculture activities are not an available option for the poor because they do not have land (Tra Vinh, Ninh Thuan)[3]. Since land was sold for the better-off who do extensive aquaculture farming, the poor do only the paid labour.

Livelihood opportunities: Situation – constraints – trends

Overview: In general, *there is diversity in livelihoods of surveyed communities* (both coastal and inland). Livelihoods range from *agriculture* (cultivation, animal husbandry) to *fishery* (catching/exploiting and aquaculture), *home production* (seafood processing such as fish sauce, shrimp paste, dried fish and squid), *and trade services* (small scale trading) and hired workers (for all types of activities including labor exporting). Most surveyed communities have more than 10 types of livelihoods (income generating activities). For instance, Duong Hoa and Quang Dien communes have as many as 17 livelihoods, Phuoc Dinh, Phuoc Diem have over 15 livelihoods.

Aquaculture livelihoods: status quo and trends

In general, 100% of surveyed communities (both coastal and inland) have livelihoods/activities in aquaculture. In some communities, these livelihoods contribute greatly to income generation. It is worth noting that all communities realize that they are sustainable in the future and selected as the first priority livelihoods. However, specific activities/livelihoods vary from community to community.

Coastal surveyed communities have more diverse livelihoods in aquaculture: (i) surveyed communities in Ninh Thuan focus on shrimp/fish cage rearing, shrimp hatchery, sweet snail and especially *E.Cottonii* seaweed (recently); (ii) in other coastal communities in Ha Tinh, Ninh Binh, Quang Ninh, Tra Vinh aquaculture activities focus on tiger prawn rearing, sea fish cage rearing, brackish water crab, oyster and other mollusk cultivation.

[3] There are many examples in Vietnam whereby resources have been allocated to wealthy outsiders and not to poor households in local communities eg. Sea water surface in Van Phong Bay, Khanh Hoa province given in leasing to Japanese, Korean and European private companies to farm pearl oysters, green mussels and fish in cage. It is also envisaged that part of such resources should and could be directly exploited by the poorest within local communities. One of the most difficult case in Thach Ban (box 4.2), has been the allocation of land with associated title deed ("red book") to "real" poor households.

Inland surveyed communities focus their aquaculture livelihoods on freshwater fish rearing (which has been ranked as the top income generating livelihood in aquaculture in these communities) of Ha Tinh, Quang Ninh, Ninh Binh and Tra Vinh. Various forms of freshwater fish rearing are practiced in lagoon, river, lake, low rice field (rice-fish farming)

For coastal communities: ***Livelihoods in fishery*** dominates in a few communities in terms of number of workers and generated income. For example, more than 50% of workers/households are involved in fishery and income from fishery (fish catching/aquaculture) is ranked no. 1. In some coastal communities, fishery livelihoods account for over 30% of total income (e.g. Thach Hai commune – Thach Ha – Ha Tinh; Kim Dong – Kim Son- Ninh Binh) and 50% of total income and total population (Kim Dong commune of Kim Son District)

- Potential for fishery livelihood development: offshore fish catching is not clearly apparent in poor fishing communities. In these areas, though there are positive views on off-shore fishing potential, there is still limitation of off-shore fishing in terms of vessels as those vessels belong to the cooperative (stated owned) and only few fisherfolks work in the vessels. Poor fisherfolks do not have access to sufficient capital for investment in vessels. Their livelihoods are centered on inshore exploitation. However, this unsustainable livelihood is about to cease soon due to coastal resource depletion and the Law of Fisheries discouraging such activity.
- Although presently aquaculture ranks second after agriculture (rice growing, husbandry, cattle raising etc.) in terms of livelihoods, it contributes considerably to income generation. The trend is becoming more oriented toward greater intensification, expansion of cultivated area, and change in cropping patterns. More important is that communities consider aquaculture having great potential and being sustainable. The common trend in all communities, particularly poor fisherfolks, is an income diversification through pro-poor aquaculture including pond and cage culture systems and a range of species comprising crustaceans (shrimp and prawn), molluscs (sweet snail, oysters, clams), fresh and brackish water fish, frogs and seaweed (e.g. *E. Cottonii*).
- Industrial and home production livelihoods exist but account for an insignificant proportion in surveyed communities. Remarkably, few of them have traditional trades such as fish sauce making in Phuoc Dinh, Phuoc Dien (Ninh Thuan), fish sauce and paste making in Thach Hai (Ha Tinh).
- Other coastal related livelihoods, such as small scale services, trading, and casual labour are common in all coastal communities, contributing to income generation. In particular,

some communes such as Phuoc Dinh and Phuoc Diem in Ninh Thuan Province hired labour in shrimp farms like digging, feeding the shrimps or working in vessels. These activities bring significant contributions to poor communities especially for male workers. For women in fishing communities, casual labour tends to be in small scale seafood processing (Hatinh, Ninh thuan), trading, in shore-catching (Ninh Binh, Ninh Thuan), and seaweed raising (Ninh Thuan),

For inland communities: ***Agriculture-related livelihoods*** are predominant. In many surveyed communes, income from agricultural livelihoods accounts for above 80% of total income (Duong Hoa commune, Tuong Son commune, Vuong Loc commune); this figure is over 40% in the other communities.

- In general, potential for agricultural livelihoods is very limited; most communities have disadvantaged production conditions: drought-stricken, infertile land in Ninh Thuan, Ha Tinh. In Ninh Binh, Quang Ninh, Tra Vinh provinces, limit land area for cultivation in many communities.
- However, some communities (including coastal) have potential for animal husbandry. For example, Phuoc Dinh and Phuoc Diem in Ninh Thuan province have potential for sheep (the most important sheep raiser in Vietnam), goat and cattle raising. In the other communities, pig raising made a considerable contribution to income generation. In many areas including coastal areas (Ninh Binh, Ninh Thuan), the combined livelihood economies for households are strongly preferred (integrated husbandry and agriculture/gardening with pond fish culture known as V.A.C system in Vietnam) with the reasons of low costs and low risks.
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Priority livelihoods for the fishing communities

As mentioned earlier, this is the top priority livelihood option of consulted communities. There are several aquaculture systems which are currently practiced in Vietnam but not all would be suitable for poor communities who generally lack or have limited technical knowledge, experience and access to capital. Therefore, given their current potential and external financial resources, the poor

communities have pointed out various pro-poor aquaculture livelihood options which would be appropriate for them as summarized in the following table.(Table 1).

Table 1 – Priority livelihood by fishing communities

Province	**Selected livelihoods/models of coastal communities (*)**	**Constraints**	**Selected livelihoods/models of inland communities**	**Constraints**
Quang Ninh Hai Ha	**Quang Dien commune**: - Freshwater fish rearing (in-dyke area): 1st priority; - Oyster and molluse (tidal zone): 2nd priority.	**Lack of Government control:** seeds Weak Market Storm and soil down-sliding Exploitation of near shore resource – exploitation of resources	**Duong Hoa commune**: - Freshwater fish rearing (in-dyke area): 1st priority.	Lack of technical guidance Lack of infrastructure Often Flooded Salted underground water
Ninh Binh Kim Son	**Kim Dong Commune** -Brackish water fish/shrimp/crab farming (alternatives): 1st priority.	*Lack of inlet-outlet channels – water polluted* Diseases Lack of good seeds Lack of technical assistance/extension	**Binh Minh commune** - Freshwater rice-fish farming (combination):1st priority.	*Salted soil,* degradation of soil
Ha Tinh Thach Ha Can Loc	**Thach Hai Commune (**)** -Freshwater fish rearing: 1st priority.	*Lack of infrastructure (dike and inlet-outlets flows) and proper zoning* *Lack of high quality seeds* *Diseases, hazards* *Low awareness to protect environment* *Market*	**Tuong Son Commune** - Freshwater fish rearing (fish-rice): 1st priority.	*Lack of capital, technical assistance* *No market*
	Thinh Loc Commune - Fish rearing in pond (freshwater): 1st priority; - Fish-rice farming (rotation): 2nd priority.		**Vuong Loc Commune** - Fish rearing in pond, lake (freshwater): 1st priority; - In-field fish farming: 2nd priority.	
Ninh Thuan Ninh Phuoc	**Phuoc Dinh Commune** - Inshore farming of E.Cottonii seaweed: 1st priority.	*Lack of capital, infrastructure, know how (raising and post*		

Province	Selected livelihoods/models of coastal communities (*)	Constraints	Selected livelihoods/models of inland communities	Constraints
	Phuoc Diem Commune - Inshore farming of E.Cottonii seaweed: 1st priority.	*harvest)* *Low and fluctuated Price* *Risky due to environment, diseases*		
Tra Vinh Cau Ngang	**My Long Nam Commune** - One rice-one shrimp: 1st priority, effective -Tiger prawn farming: 2nd priority .	*Environment degradation* *Lack of capital, technical, extension, infrastructure* *price fluctuations* *Diseases*	**Hiep My Dong Commune** -Tiger prawn farming: 1st priority -	*No land* *Lack of capital*

Note: (*) *Selection is based on 3 criteria (i) Economic benefit (income generation) for the poor (both presently and in the future); (ii) Sustainability (including social and environmental aspects); (iii) Availability/ Feasibility of supports (from central and local government, Donors, and Technical Assistance).*

(**)Thach Hai commune is the coastal commune but some villages are located by the beach. Some villages are categorized as inland coastal and not close to the sea. The inland coastal areas have a river and a lake, so the freshwater is selected as potential livelihood.

The study identified several constraints for poor households to develop those livelihoods which varied from area to area. Some commonly identified implications are the following:

- **Environment**. Natural resource constraints caused by generally degraded environment (polluted water, increased salinity, massive use of pesticide in agriculture), affect key

livelihoods of the people such as rice cultivating, aquatic product exploitation and aquaculture. It also causes spreading of diseases.

- **Extension**. Lack of technical officers and extension workers to train and support farmers to start and/ or improve agriculture and aquaculture system.
- **Credit**. Many households are unable to access formal credit systems such as Vietnam Bank for Agriculture and Rural Development (VBARD) which require collateral. Moreover, some aquaculture systems such as intensive shrimp farming are considered a high investment-high risk activity especially for poor households.
- **Infrastructure**. Generally the water supply and drainage systems are obsolete and insufficient to serve these communities. This has a tremendous impact on the fresh water supply for household use, irrigation and aquaculture activities. For the latter, the lack of a suitable water management system including inlet water supply and storage and outlet water drainage and treatment pond causes disease outbreaks and crops failures.
- **Awareness**. Awareness raising for fisherfolks/farmers regarding environmental protection and disease prevention has been weak. This may put aquaculture production at risk should a disease outbreak occur.
- **Market access**. In some inland and remote areas (Hai Ha district, Binh Binh/Ninh Binh province, Can Loc district/Ha Tinh province) poor farmers face difficulties in accessing markets for selling fish.

Risks and risk management measures for priority livelihoods

In general, in all surveyed communities (both coastal and inland), risks were mainly found in *aquaculture activities.* Four most common risk groups have been identified and mitigation measures (which are in fact demonstrated in selected livelihoods) proposed by communities are as follows.

(i) Calamity risk (flooding): (i) broken or severely damaged national dykes causing total loss of farmed products; (ii) contaminated environment causing diseases (iii) broken mechanical equipment due to high flood tides (in case of *E. Cottonii* seaweed).

(ii) Contaminated water: causing mass dying of sea species for many reasons: improper planning, lack of technique, lack of a proper water management system.

(iii) Diseases: due to several reasons including natural disasters, pollution, poor knowledge of technique.

(iv) Fluctuating market price: due to several reasons including insufficient seafood planning, lack of food processing plants, lack of market information and product

marketing. Price is usually driven by local middlemen who set the price for farmers on a daily basis or on free market basis. The farmers/ fisherfolks become very dependent on these traders.

Regarding risk mitigation measures, some have been proposed by communities, which are presented in their livelihood priority as above. For instance, the model of inshore cage farming of *E. Cottonii* seaweed is likely to minimize such risks as damage by floodtides, loss of seaweed, seaweed eaten by fish. For the poor households, it seems that the integrated model (eg. Rice-cum-fish or blackish fishing in one season) seems to be feasible with fewer risks. In some areas where they do off-shore cage farming, it is possible for farmers to move their cages away from contaminated waters, but the costs are high. Among the measures, sound aquaculture zones planning, enhanced technical support, strengthened management capacity, and market mechanisms for the poor are key and highly recommended by the poor fishing communities.

Needs of the poor fishing communities

In table 2, the four possible household scenarios which are reported were identified during the study. It is likely that in each commune all cases occur although in different proportions. For each of them the approach to identification of resource and investment needs varies considerably.

Table 2: Four types of possible households scenario for aquaculture development in the consulted communes.

Access to water & land resources	Households which have access to water resources (pond, river, reservoir, in-shore sea coast)		Households which do not have access to water resources	
	Currently practicing aquaculture	Currently non practicing aquaculture	Have access to land	Do not have access to land
Basic needs for aquaculture development	▪Training, improved skills ▪Good quality seed ▪Good quality feed ▪Disease prevention ▪Extension provision ▪Access to market	▪Identify potentials for aquaculture ▪Willingness to change/ integrate livelihoods ▪Training, skills developed ▪Aquaculture facilities	▪Need to convert agriculture land to aquaculture – CPC & District ▪ Identify potentials for aquaculture & area planning	▪Land allocation – CPC & District ▪Need to convert agriculture land to aquaculture – CPC & District ▪ Identify potentials for aquaculture &

Access to water & land resources	Households which have access to water resources (pond, river, reservoir, in-shore sea coast)		Households which do not have access to water resources	
	Currently practicing aquaculture	Currently non practicing aquaculture	Have access to land	Do not have access to land
	▪Group affiliation ▪Micro-credit (poorer)	e.g. cage(s) in case a pond is not available ▪Good quality seed ▪Good quality feed ▪Disease prevention ▪Extension provision ▪Access to market ▪Group affiliation ▪Micro-credit (poorer)	▪EIA and Carrying Capacity study ▪Infrastructure need: well or water supply and drainage canals, pond excavation in case of pond ▪Willingness to change/ integrate livelihoods ▪Training, skills developed ▪Good quality seed ▪Good quality feed ▪Disease prevention ▪Extension provision ▪Access to market ▪Group affiliation ▪Micro-credit (poorer)	area planning ▪EIA and Carrying Capacity study ▪Infrastructure need: well or water supply and drainage canals, ponds excavation ▪Willingness to change/ integrate livelihoods ▪Training, skills developed ▪Good quality seed ▪Good quality feed ▪Disease prevention ▪Extension provision ▪Access to market ▪Group affiliation ▪Micro-credit (poorer)
Communes	▪Phuoc Dinh, Phuoc Diem (Ninh phuoc, Ninh thuan)	▪Vuong Loc (Can Loc, Hatinh)	▪Binh Minh, Kim Dong (Ninh Binh)	▪Hiep My Dong (Cau ngang, Ninh Thuan)

Access to water & land resources	Households which have access to water resources (pond, river, reservoir, in-shore sea coast)		Households which do not have access to water resources	
	Currently practicing aquaculture	Currently non practicing aquaculture	Have access to land	Do not have access to land
	▪Thinh Loc (Can Loc, Hatinh), Thach Hai (Thach Ha, Hatinh) ▪Quang Dien (Hai Ha, Quang Ninh)			

Other alternative livelihood options

Apart from priority aquaculture livelihoods which was chosen by most communities, other livelihoods included in the agriculture (cultivation and animal raising) were also mentioned. Results from community consultations on **alternative livelihoods** are presented as follows.

Province	Livelihood/model selected by coastal communities	Advantages	Livelihood/model selected by inland communities	Advantages
Quang Ninh Hai Ha	**Quang Dien Commune:** much focus given to aquaculture livelihoods	*Good market (to China)* *Good natural surface for molluse and shrimp*	**Duong Hoa Commune:** much focus given to aquaculture livelihoods	*Have low fertile land to convert to aqua raising* *Large land* *Have aqua zoning plan*
Ninh Binh Kim Son	**Kim Dong Commune:** - One crab – one fish	*Mitigate risks* *Pond/lagoon available* *Low investment*	**Binh Minh Commune:** - - Rice – rush [4] farming: 2nd priority.	*Low risk traditional livelihoods* *Low investment* *Salted land suitable for rush*
Ha Tinh Thach Ha Can Loc	**Thach Hai Commune:** - Rice – vegetable: 2nd priority	*Labor available* *Extension system available* *Have surface*	**Tuong Son Commune:** - Rice – vegetable: 2nd priority	*Labor available* *Extension system available* *Having Land*

[4] A kind of plant, grown in salted soil areas, used for handicraft mats, boxes etc.

	Thinh Loc Commune: - focus on aquaculture*	*Have support from local government* *Local seed available* *Long coastline, good condition for species*	**Vuong Loc Commune:** - focus on aquaculture	*Have land to convert* *Have lakes* *Low investment*
Ninh Thuan Ninh Phuoc	**Phuoc Dinh and Phuoc Diem Communes:** - Sheep, cow raising: 2nd priority	*Labor available* *Meadow available* *Suitable Loan size for household borrowings*		
Tra Vinh Cau Ngang	**My Long Nam Commune:** -- Agriculture (rice, other crops, cow raising) 1st priority - Near shore catching: 2nd priority -	*can combine rice – shrimps with salted land* *Low investment*	**Hiep My Dong Commune** -- Agriculture (rice, other crops, cow raising) 1st priority - Inland fishing: 2nd priority	*can combine rice – shrimps with salted land* *Have market* *Low investment*

Note (*): In Can Loc, the aquaculture models include (1) 1 rice -1 fish; (2) 2 rice cum fish 3) 2 rice-1 fish; (4) Fish pond; (5) Raise small fish spices for seed ; (8) Cage Fishing (9) Fisheries in lake (10) duck-fish.

Role/capacity of local authorities (provincial/district/communal) and organizations in poverty reduction for communities

In general, the roles and capacity of the local authorities and officials at all levels in aquaculture development and management still represent constraints for economic development and economic integration. In some provinces (Ha Tinh, Quang Ninh, Ninh Thuan) where many development projects have been implemented, local government officials reflected a need to have good management and leadership skills that enable them to receive, manage and implement development projects in a proper manner. More emphasis would be required on strengthening management capacity of fishery staff at all levels.

There is a general observation of management capacity for fishery development in Vietnam: "Management capacity is limited, far from meeting development and integration requirements. State management apparatus for fishery at district and communal level is asynchronous. It is noteworthy that in many provinces with potential for fishery development district and communal fishery departments have not been established yet. In the case of Ninh Binh, there has no separate local department of aquatic products but lack of officers under DARD (Department of Agriculture

and Rural Development) to implement the aquacultural economies and extension support" (Source: 5 year Review Report [2001-2005] of Ministry of Fisheries)

In reality, the fishing communities appreciated the support from many social groups like NGOs, and mass organizations at all levels (Women's Union, Farmers' and Fishermen's Associations) and credit organizations (VBARD and Vietnam Bank for Social Policy - VBSP) which are considerably important for poverty reduction in general and fishery development in particular in all provinces.

Women's Union at many levels (province, district, commune, hamlet) in some provinces such as Ha Tinh have extensive experience in receiving, managing and implementing community-based foreign funded projects (e.g. projects funded by IFAD, UNDP). In other provinces like Ninh Thuan, Quang Ninh, local Women's Union has recently been participating in development projects (for example Quang Ninh Women's Union made great contribution to the success of Project PAM 5322).

Farmers' and Fishermen's Associations at many levels (province, district, commune) in surveyed provinces have experience in managing and implementing projects funded by their Central Headquarters and have actively supported community development projects.

VBARD has participated in receiving funds, disbursement and handling financial transactions for development projects. At the moment, provincial branches of VBSP are dealing with these activities. From the consultation it appears that the capacity and willingness to receive funds disbursed by this banking system are sound, but the poor still meet many difficulties with procedures, and in raising collateral. Term and size of loan are still not relevant whereas the VBARD does not offer a combined savings and credit scheme which would be very highly appreciated by the poor fishing communities.

The main recommendations from the research team for aquaculture development include the followings:

- Addressing poverty issues and pro-poor fishery development: Identify the most suitable pro-poor aquaculture systems (pond, net enclosure, cage, mono and polyculture) & species context specific which are appropriate for the consulted communities, especially low-in-the-food-chain species (e.g. sea cucumber, tilapia, seaweed, mussels, clams and other molluse);
- Development of master plan: the development of aquaculture is within the provincial, district and commune master plan;

- Establishment of self-help mechanism: Encourage small-scale farmers to get affiliated in self-management groups and Aquaculture and Fishery Associations. Or identify and set-up a savings & credit scheme via Women's Union and/ or local credit organizations to meet the investment needs for each kind of aquaculture model proposed; support mechanisms to assure financial sustainability to farmers' groups and Association as project exit strategy (e.g. OASIS)
- Identify aquaculture training needs and provide technical training to farmers. Beside technical subjects, trainings shall include: (a) record and book keeping; (b) basic aquaculture economics, and (c) business plan development to improve farmers' capacity to get a loan and to manage aquaculture business;
- Provide technical support through sufficient and capable local extension officials from DARDs and DOFIs.. Improve the extension system by supporting the establishment of Voluntary Extension Workers at commune and hamlet level;
- Support and train Associations to improve skills and capacity to represent farmers, have access to information and deal with early disease warning system and management (including medical kits/boxes and water quality test kits);
- Identify the source of good quality seed for the identified species and help the community to access them; Whenever possible, establish backyard hatcheries in selected households to breed and nurse freshwater species;
- Support "needs based" R&D in DOFI, Universities and Research Institutes for Aquaculture (RIAs) to develop technology to breed pro-poor aquaculture species. Support in-country technology transfer of already proven technology [e.g. sea cucumber (*Holothuria scabra*) and abalone (*Haliotis asinina*) in RIA-3; freshwater giant prawn (*Macrobrachium rosembergii*) in RIA-1 and RIA3 and Can Tho University);
- Identify alternative aquatic product outlets and help communities to build commercial links with those markets;
- Explore alternative and complementary livelihood options including aquaculture and capture fisheries post-harvest processing added value and link to national and international markets (e.g. dried sea cucumber to Hong Kong; dried seaweed to Malaysia and China);
- Encourage and support local initiatives to raise community awareness about environment and livelihoods (e.g. mangrove reforestation; small initiatives in primary school);
- Infrastructure development (irrigation and roads); improve the dyke to ensure sufficient fresh water (in some provinces).

- Enhancing administrative reform and ensuring the effective implementation of Fisheries Law

Recommended measures to reorganize aquaculture production

- Strengthening the forecast of fishing ground; train fishermen in off-shore fishing. Some places within the study areas are successfully piloting Marine Protected Areas (MPAs) for specific fisheries habitats (Kim Son/Ninh Binh province, Tra Vinh province). Other provinces like Quang Ninh, Ninh Thuan do not have MPAs yet, and there exist serious environment effects on the fisherfolk livelihoods;
- Adjustment of regional aquaculture planning towards stable and sustainable development; Finalizing planning and developing regulations on inland aqua reserves and marine reserves; Releasing breeds of shrimp and fish to the wild in order to regenerate and develop aquatic resources; Planning of water supply and drainage system for aquaculture;
- Allocating the proper fish boat warning system seems to be at high attention of most local officials. However, due to financial and investment constraints, most areas consulted do not have a proper emergency awareness system. This may cause losses for the people working offshore. It is recommended to the government support the implementation of effective models that promote the cooperation of fishermen investment and government's services with on-the-sea operations in cost-sharing manner to better respond to fluctuating input costs. Support fishermen to help each other in case of emergency at sea;
- Strengthening information dissemination activities on protection and development of marine resources;
- Encouraging the development of diverse aquaculture at sea and on islands and assuring access be prioritized for poor households in the vicinity, depending upon interest and demand that should be promoted through awareness building and other educational and training activities;
- Develop community-based and co-management pilot models within an Integrated Coastal Zone Management framework and under the Gov. decentralization process promoted by the Fisheries Law and Decree on Democracy;
- Foster environmental conservation and the use of Environment Impact Assessment (EIA) for aquaculture development;
- Building capacity for aquatic animal health in aquaculture;
- Further develop post-harvest technologies;
- Introduce standard for aquatic products for food security and produce. Trace-ability: Develop a bar code system for farmed aquatic products in safe aquaculture farming zones following BMPs and GAPs to comply with EU and other international market regulations;

- Emphasizing international markets as driving forces for sustainable development of aquaculture while attaching appropriate importance to domestic market.

Recommended measures on institution development for fishery /aquacultural development

From the survey on management and implementation capacity of local authorities and mass organizations at appropriate levels in all 5 provinces, management and implementation model of projects have been discussed and suggestions are as follows:

- Keeping in mind the pro-poor approach that land and water resources, particularly publicly owned/controlled land and water resources that could be converted to productive resources, be predominantly allocated to poor households in the vicinity rather than being allocated to wealthier groups.
- In order to strengthen management and monitoring capacity for communities, it is recommended that local authorities function as good project planners and environmental management managers and resource use planners. Projects must be designed to meet the needs of local communities (technical and others) in an environmentally sound and socially acceptable manner. Although surveyed communes participated in managing and implementing funded projects, none of them worked as project managers, especially in fishery projects.
- Initially district authorities would be project managers who would give instruction to and supervise communal authorities and communities for the fulfillment of commitment to funding sponsors. In addition, there are often 2-3 fishery technical workers at district level who would be able to provide technical support to participants to pilot projects;
- People's Committees and interested organizations in project communes should bear the responsibility to disseminate project information to communities;
- Pilot Projects should be implemented by household or group of household
- Promoting fishery extension in exploitation and protection of aquatic resources, in breeding (seed and species raising/keeping in local area), farming, product processing and post-harvest services;
- Strengthening cooperation in R&D, breeding and feeding technologies, resources forecast; use of alternatives method to banned chemicals (e.g. BMPs and GAPs);
- Enhancing international cooperation, experience exchange; effective implementation of international projects funded by Norad, Danida and other organizations as SEAFDEC, NACA, FAO, and the World Fish Center;

- Finalizing development planning of training institutions in fishery industry and preparing human development strategy with emphasis on technical and staff management;
- Socializing i.e. Mobilizing other resources and assistance than the government support regarding training and capacity building activities within the fishery industry;
- Encouraging the participation of the private sector; applying community-based model with enhanced roles of associations and cooperatives in production and business services; fostering national initiatives in public-private partnership.

Key recommendations on the process to identify aquaculture development/ pilot work (from the views of the research team)

- Identify target beneficiaries and engage in consultation with them and local authorities;
- Carry out a thorough PRA in the pilot commune(s) with the general objective of developing aquaculture and water resource management for poverty reduction;
- Identify the most suitable pro-poor aquaculture systems (pond, net enclosure, cage, mono and polyculture) & species context specific which are appropriate for the consulted communities, especially low-in-the-food-chain species (e.g. sea cucumber, tilapia, seaweed, mussels, clams and other molluse);
- Make sure that development of aquaculture is within the provincial, district and commune master plan;
- Define and quantify type(s) of intervention needed. For example, according to sub-group in the pilot commune: people currently involved in aquaculture, people without access to water & land resources;
- Identify aquaculture training needs and provide technical training to farmers. Beside technical subjects, trainings should include: (a) record and book keeping; (b) basic aquaculture economics, and (c) business plan development to improve farmers' capacity to get a loan and to manage aquaculture business;
- Carry out all EIAs, Carrying Capacity and other relevant study to aquaculture development;
- Encourage and support local initiatives to raise community awareness about environment and livelihoods (e.g. mangrove reforestation; small initiatives in primary school);
- Support "needs based" R&D in DOFI, Universities and Research Institute for Aquaculture (RIAs) to develop technology to breed pro-poor aquaculture species. Support in-country

technology transfer of already proven technology [e.g. sea cucumber (*Holothuria scabra*) and abalone (*Haliotis asinina*) in RIA-3; freshwater giant prawn;

- Identify sources of good quality seed for the identified species and help community to access them;
- Whenever possible, establish backyard hatcheries in selected households to breed and nurse freshwater species;
- Infrastructure development (irrigation and roads);
- Improve the dyke to ensure sufficient fresh water (in some provinces). Improve the dyke to ensure sufficient fresh water (in some provinces);
- Ensure all other inputs (extension, credit, clustered in Associations,.-see section X below);
- Link to other development initiatives in the area.

Chapter 1: Introduction

1. Summary

Over the past decade, the resource base supporting fishing communities in coastal and inland Vietnam has been depleted or is in a state of serious decline to the point where livelihoods are seriously threatened. Therefore, it is critical to move towards improved management of the fishery sector complemented by the development of alternative income generating activities. Improved fisheries management would need to be comprehensive, addressing issues of the use of captured fisheries gear and the establishment of environmentally sound practices and actions to improve and sustain fisheries productivity and biodiversity.

To achieve the above, a co-management strategy would need to be developed that would engage local households and communities; local organizations (Fishermen's Associations, Women's Unions, other NGOs); local government departments (DOFI, MPI, PPCs); credit institutions (VBARD and BSP), and the Ministry of Fisheries. The current Vietnamese legal framework[5] allocates specific responsibilities to local governments with regard to the management of fisheries, coastal and inland waters, aquaculture development, and the establishment of protected areas. Experience has shown that direct engagement of all stakeholders in formulating management plans for natural resource use is the strongest approach to assuring sustainable and productive use of those resources.

1.1 Objective

The main objective of this work is to develop the information required to formulate a follow-on project that would be of benefit the poorest fishing communities in particular in the country through sustainable development and management of inland aquatic and coastal resources. This would be done under that operation through the implementation of pilot demonstrations that would include alternative income generation activities such as (a) aquaculture, handicrafts, and other options that would be identified during the seed-grant phase; (b) provision of training for management, environmental monitoring and productive activities; and (c) strengthening of local institutions and community groups in cooperative decision making for sustainable resource use. These pilot-scale

[5] 2003 Vietnam Fisheries Law (2003); Decree on Democracy (2003)

activities would be selected through a community driven demand process that would draw together all interest groups, including local governments, NGOs, and others.

The specific activities under this assignment would include the following (as the original TOR required):

a) Consultation with poor fishing communities in representative and geographically diverse coastal and inland areas to understand the constraints they face with regard to generating income;

b) Discussion with poor fishing groups the potential options for alternative employment as they pertain in particular to marine and coastal aquaculture development based on the experience in Vietnam and China and with local governments the types of interventions -- e.g., establishment of areas for sustainable aquaculture development, support facilities, environmental monitoring capacity, training needs, etc. -- and actions that would be required for men and women from poor households to gain access to the use of land and water resources for this purpose. Emphasis should be placed on marine aquaculture options since there are many suitable near-shore areas for development as well as inland options for diversification of agricultural production -- e.g., further development of integrated rice-fish and other farming involving animal husbandry and pond fish culture;

c) Exploring options that can help poor households gain access to required training, area for production, inputs, credit and other production needs in an environmentally sound and socially acceptable development strategy from gender and ethnicity viewpoints and preferences;

d) Identifying the specific constraints that limit poor households in gaining access to resources and credit and suggest means by which these constraints can be overcome to improve livelihoods in a sustainable manner;

e) Preparing a summary report of the main outcomes of the consultations with regard to the identification of development options, policy needs and investment required improve the livelihoods of poor fishing communities and the resource base upon which they depend.

1.2 Method

Key Features of Our Approach

A comprehensive framework is to be developed matching two methods: qualitative and quantitative. However, there is a need to focus more on PRA, PPP, in order to facilitate obtaining information from the communities.

The three main phases of this small scale consultation include: literature review, direct consultation with fishing communities at local levels and stakeholder dialogues for sharing and validation of information at higher level.

- The consultation will be conducted following the community based and participatory approach. Participation is highly promoted and exercised during the workshop as is grassroots consultation in the villages/communities especially the poor fisher folks.
- Benchmarking with non-fishing communities can be useful, as can comparing the regions with different natural characteristics like inland and coastal areas where the fisheries communities are earning their living differently.

1.3 Selection of area

Two provinces represent the North (Quang Ninh and Ninh Binh), 1 for the Middle (Ha Tinh) and 2 for the South (Ninh Thuan and Tra Vinh). One representative district is selected for each province (2 for Ha Tinh) and 2 communes for each province (1 inland and 1 coastal commune) representing the district features. The selected communes shall ensure the following norms: (i) contain a large number of poor households; (ii) be diverse in ethnic groups; (iii) have demand and capacity of economy mechanism shifting with emphasis on aquaculture development; (iv) transparency and willingness of the local authority; and (v) participation capacity and commitment fulfilment of the local people (community). Selection of commune for survey is as follows:

Table 1.1. **Selection of commune for survey**

Province	District	Coastal commune/hamlet	Inland commune/hamlet
Northern			
Quang Ninh	Hai Ha	Quang Dien	Duong Hoa
Ninh Binh	Kim Son	Kim Dong	Binh Minh
Central			
Ha Tinh	Thach Ha	Thach Hai	Tuong Son
	Can Loc	Thinh Loc	Vuong Loc
Southern			
Ninh Thuan	Ninh Phuoc	Phuoc Dinh Phuoc Diem	
Tra Vinh	Cau Ngang	My Long Nam	Hiep My Dong

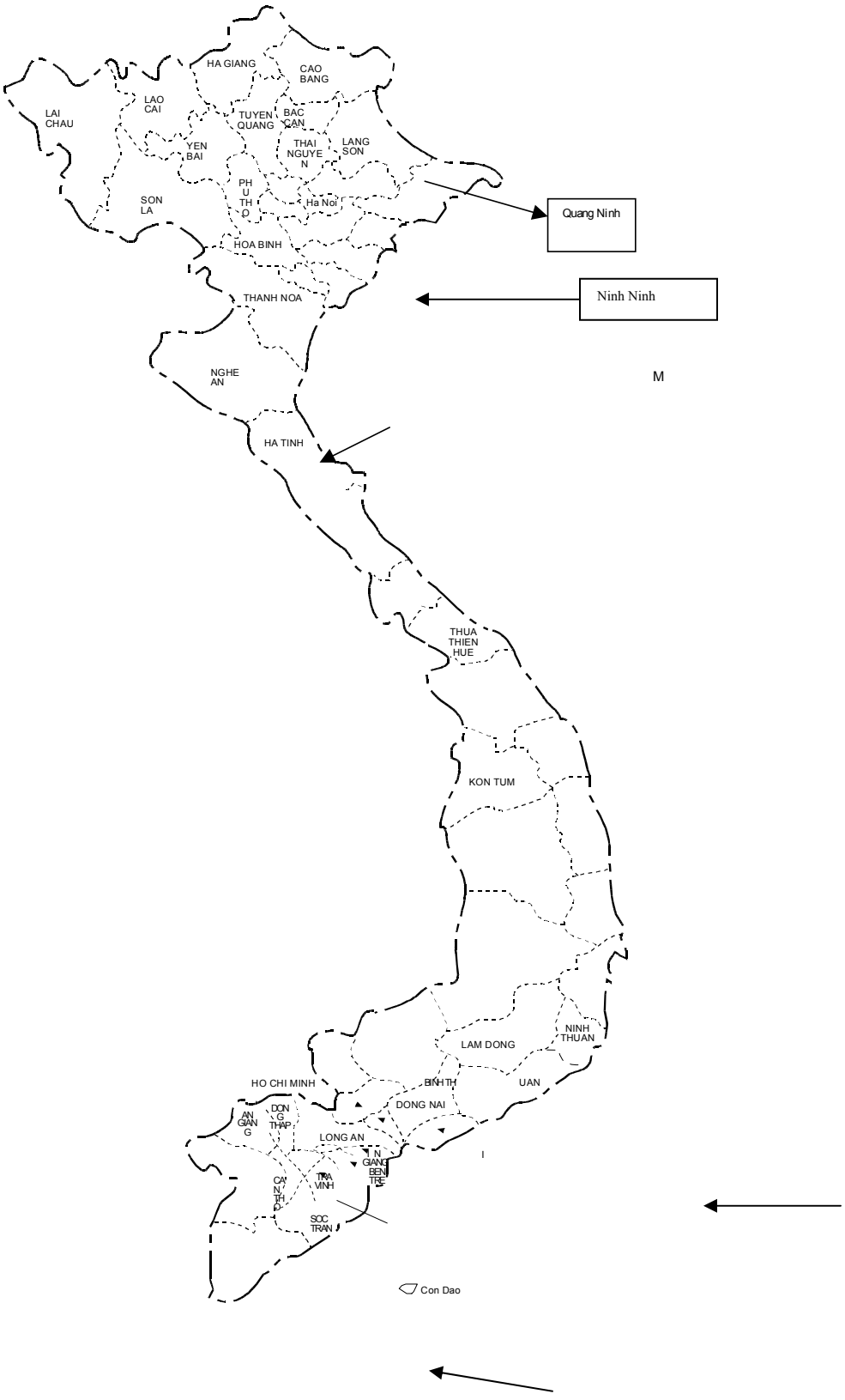
1. 4 The stakeholders

Consultation with stakeholders using a participatory approach: it is intended to engage local households and communities; local organizations (Fishermen's Associations, Women's Unions, other NGOs, etc); local government departments (DOFI, MPI, PPCs, etc.); credit institutions (VBARD and VBSP), and the Ministry of Fisheries. Current Government instruments[6] allocate specific responsibilities to local governments with regard to the management of fisheries, coastal and inland waters, aquaculture development, and the establishment of protected areas. The team would pay particular attention to the participation of poor women and ethnic minorities in fishing communities.

1. Fishing communities
2. Local government
3. Mass organizations at local levels and other civil society groups (if any)
4. Private sectors and credit institutions

[6] 2003 Vietnam Fisheries Law

5. Map of Vietnam



Chapter 2: Findings from the communities

2. The coastal and inland water areas characteristics in Vietnam

2.1 General about coastal areas

The coastal areas in Vietnam comprise of 28/64 towns and cities directly under central government, 14 cities under provincial government, 28 towns, 273 suburban districts, 38 urban districts, 68 wards, 243 towns and 4.134 communes. The total area, including 28 provinces, is appropriated 41% of Vietnam. Details as follows: (i) 5 North provinces (Quanh Ninh, Hai Phong, Thai Binh, Nam Dinh, Ninh Binh); (ii) 6 North central part provinces (Thanh Hoa, Nghe An, Ha Tinh, Quang Binh, Quang Tri, Thua Thirn Hue); (iii) 8 South central part procinces (Da Nang, Quang Nam, Quang Ngai, Binh Dinh, Phu Yen, Khanh Hoa, Ninh Thuan, Binh Thuan; (iv) 2 South-East provinces (Ba Ria - Vung Tau, Ho Chi Minh city;(v) 7 South-West provinces (Cuu Long river delta – Ben Tre, Tien Giang, Tra Vinh, Soc Trang, Bac Lieu, Ca Mau, Kien Giang)

2.2. Poverty:

The Main Causes (from the poor fishing communities' perspectives)

High population causes poverty: The coastal area has high population growth, both in terms of natural growth (particularly in fishing communities) and mechanical growth (mainly in fast developed industries and services areas). The coastal area has a large scale population with high density, 369 persons/ km^2 medium. However, there has been an unequitable allocation in provinces and cities. From Hai Phong to Ninh Binh, average population density (2001) is 981person/km^2. Meanwhile from Thanh Hoa to Thua Thien Hue this density is only 198 person /km^2. In the area of Cuu Long river delta, this figure is 577 persons /Km^2. In other areas such as Hai Hau (Nam Dinh) which has high popualtion density, about 1.221 person/km^2

Absence of employment opportunities is widespread in the coastal area, causing poverty: Access to farming land per head is low but agriculture still constitutes the largest scale of employment. The number of employment in industries and services is still limited, except in cities. Increasing urbanisation and new tourist sites in the coastal area are factors leading to resettlement and reallocation of employment between urban and rural areas. Women's employment accounts for 50% of total employment and they tend to be involved in heavy, labor intensive work such as

planting rice, harvesting aquaculture or processing and small businesses (although this area has large potential in the development of tourism and industry).

Other reasons for high incidence of poverty include sole dependence on agriculture, unfavorable natural conditions, and slow economic development more generally. There are constraints in opportunities for diversification of livelihoods.

Poverty is significantly higher in rural areas and in particular among ethnic minority groups. In the selected province, there was a relatively high representation of ethnic minority groups which allowed the team to gather data and understand the poverty issues of this group. In Tra Vinh province, which has quite a large number of Khmer communities (the percentage of Khmer households accounted for about 32% of the total households of the province but the number of the Khmer poor households accounted for 38.8%), poverty is intimately linked to the longstanding customs and maintenance of traditional livelihoods; incomes remain low from agricultural livelihoods (cultivation and animal raising). The extent of poverty is reflected in the shortage of lands for production and land tenure. (According to the provincial officials in Tra Vinh figures on poor Khmer groups from August 2004 show 12,348 households without land for production, and 1,427 households have only under 1,000m^2 production land, 4,508 households have 1,000 – 3,000 m^2 production land)

Poverty is also prevalent among women. Consultation with women groups in fishing communities allowed the team to capture the causes of poverty including (i) Women's lack of skills (ii) women have livelihoods as well as childcare responsibilities (iii) women's education level is low (iv) women have more difficulty than their male counterparts in accessing paid employment opportunities. More specifically, the illiteracy rate among women is still high; hence women lack production knowledge and have difficulties in accessing information useful for their livelihoods.

Degradation of environment and resources constrain the incomes of the poor significantly since their livelihoods are dependent on natural resources: Near shore fishing used to be the main livelihood and over exploitation of these marine resources has exhausted the potential of this form of livelihood. This situation has also caused other problems such as difficulties in obtaining a fresh water supply, downgrading the environment and misusing land (like case of Ninh Thuan). Aquaculture production without proper zoning has been a serious problem.

Box 2.1 Causes of poverty in Tra Vinh

- The location with interlaced rivers and streams systems but limited transportation links causing low economic dynamics
- most farming lands are infected by virtual salt causing low yields yet the people mainly depend

on agriculture

- Lack of infrastructure
- Natural calamity and diseases causing bad harvests and losses in many years.
- Commodity market supply (outputs and inputs) are generally unstable, which causes losses for agricultural and aquatic products
- High population growth rate exacerbates unemployment and there is a shortage of stable employment, unskilled employment appropriates 90% of total labor resources
- The poor still have difficulties in accessing resources, particularly credit. They have to use external credit facilities (money lenders) with high interest rates
- Low education levels; lack of knowledge, production experiences and information; reliance on traditional or customary livelihoods which are highly unproductive are the poor's constraints

2.3 Coastal resources: situation analysis and utilization

2.3.1 Natural resources in the selected coastal areas

- *Estuary:* There are over 50 estuaries along the coast. The estuary area is strongly developed economically, in terms of fishing and seafood processing, business, transportation and urbanization. However, the development of this area at present is not really sustainable in terms of economic returns due to lack of proper zoning and lack of ports (including fish ports and trade ports). Environmental degradation in this area is remarkably high. This is evident in polluted surface and ground water resources due to the vast and uncontrolled production activities. Swamp and flooded water areas predominate along the lagoon and extensive tidal zone along the coast, estuary and surrounding islands.

- *Land availability*: Land in this coastal area is always assigned for farming, planting, and aquaculture, urban and industrial development. The downs and low-lying salt-marshes are two special resources with high attention in the coastal area that would bring future economic returns. Land resources are open for inland (fresh water) aquaculture.

- *Landscape for tourism:* The coastal area has potential for developing tourism with beautiful sand-banks and clean water. While industries and services are under developed, there is potential for establishing small-scale trading and tourism businesses in these areas.

- *Marine resources:* There are a lot of natural resources in the sea and coastal areas such as: fish (2.000 kinds of fish species, ecology system, coral reefs and mineral resources. In the sea and the coastal area, resources are open for in-shore aquaculture, brackish water aquaculture or off-shore fishery.

2.3.2 How do the poor fishing communities use the coastal resources?

Group discussions in all provinces showed that the poor are constrained in accessing resources for aquaculture livelihoods for poor people

- Offshore catching: this requires large-scale investment in vessels and equipments, as well as technical capacity, and has high risks due to hazards so it is not suitable for the poor.
- Near-shore catching: the poor can still have small boats and facilities for near-shore fishing. However, exploitation of this resource is not encouraged (pursuant to Fishery Law by the government). The fisherfolks are still using destructive catching methods in near-shore fishing, causing serious environmental damages
- Near-shore aquaculture resource for aquaculture production and processing: poor households cannot access the water because they do not have ownership of the water surface (which belongs to the state owned company, is open at prohibitively high price bidding, or under management of the provincial authority).
- For inland (fresh water) production or fish farming, the poor communities use their land that has been converted to ponds or lagoon (Ha Tinh, Ninh Binh, Quang Ninh), the shifting of low-efficiency agriculture land into aquaculture area is also a good approach which can help poor people to move out of poverty. But in many cases, the poor have little land or no land tenure or land belong to the better-off (Tra Vinh, Ninh Thuan) which causes paid employment to become the poor's livelihoods. However, research in the surveyed areas reveals that poor people cannot shift to aquaculture now as they do not have sufficient initial capital. In the surveyed communes, only normal or wealthy households can invest in aquaculture. However, the fishing communities are involved in aquaculture on a household scale with severely limited farming skills. The support facility to enable effective use of these inland resources includes a solid irrigation and drainage channel system to supply sufficient water for aquaculture.

- The coastline area (for brackish water fishing) seems available for the poor. However, the poor benefit less from this and are left with more difficulties since some of these areas are prone to flooding (Quang Ninh), have a poor inlet- outlet system (Ninh Binh), are inside the dikes (Quang Ninh), or are over-salinated (Tra Vinh, Ninh Binh) which creates significant difficulties for livelihoods due to high investment risks and high possibility of diseases.

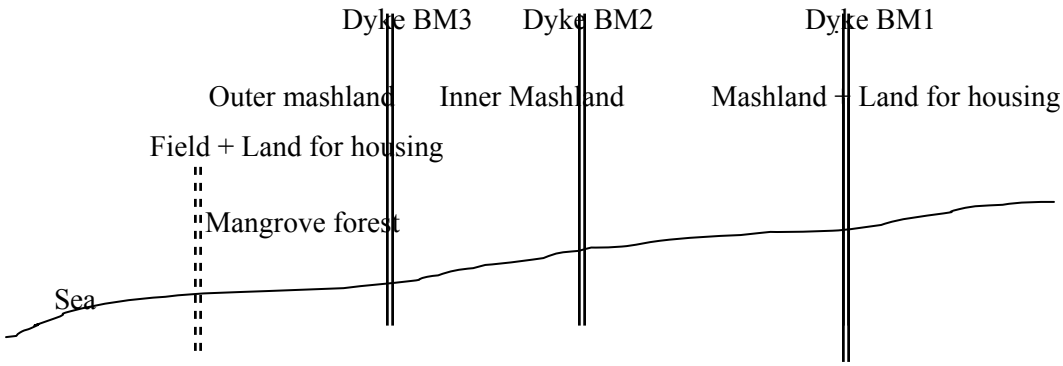
However, there are advantages of diversified resources for livelihood which have been shown quite clearly through the consultation. The poor fisherfolks use natural coastal areas (tidal areas outside the dike) for fishing and molluse raising and low fertile inland area or area inside the dike for aquaculture/fresh water fish farming and brackish fish raising. The poor communities consider near-shore fishing and catching as a good livelihood since it is "easy and does not need much investment and it creates work in agricultural idle time". The poor can earn stable incomes from this method. The table below from Ha Tinh province shows that the resources are not fully utilized for the poor's livelihood options. The poor fishing communities mostly use marine resources for food security, not yet for income generation.

Table 2.1. Summary livelihoods by resources by communities in Ha Tinh

Purpose	**Residence land, garden, pond**	**Field, warp land**	**Near shore**	**Off shore resources**
For Income generation	• Other works (traditional medicine, grinding, trade) • Poultry, cattle raising, • fishing ponds	• Crops: rice, maize, potato, peanut, bean. • Aquatic products keeping	Not much- - Only a small number of casuarinas has been planted; - Has not been fully used	- Aquatic products catching by boats, ships. - For some well-off fisherman households, this is the main income source - Input products for fish sauce production...)
For food security	Most used, major (Ordinary garden for potato, peanut, sesame, bean, fruit tree)	Major	• Catching oysters, snail, mussels,...	- Input products for fish sauce production...)

The marine resources, based on various geographic conditions, may create diversified livelihoods which differentiate groups of beneficiaries. The diagram below from Ninh Binh province illustrates the relation between resources and fisherman livelihoods as one example. It shows that most of the poor can only use item 4 and item 5: i.e. marsh land (salted land) for fresh water or brackish fishery. The feedback shows they met many difficulties in dealing with salted soil (can not grow crops any more since land has converted to ponds); and flooding and improper sea water flow which cause losses for brackish species like shrimp or crabs.

Diagram 2. 1 Relation between resources and livelihoods for fisherman in Kim Son Ninh Binh:



(1) (2) (3) (4) (5)

(1) Net and fish pots

Offshore fishing

(2) Fishing nets, natural fishing

Oyster farming

Planting mangrove forest

Areas (1) & (2) under the control of the district government and border guards

(3) Bidding for farming on large area (2ha / lagoon)

Raised varieties + natural varieties from the sea (BM3 dike has not been closed)

Surfing for lagoon protection

Area (3) for bidding by local people

(4) *Small-scale farming (1-2 ha / đầm)*

Fresh-water fish farming

Rice, sedge crop

(5) *Fresh water fish farming*

Rice, sedge crop

} *Zone (4) & (5) under hamlet management*

2.3.3 Resources Risks

Natural disaster/calamity risk: Unpredictability of natural phenomena such as quality and quantity, frequency of fresh water flow; the volume and the length of storms; speed and scale of natural processes; for example eroding and rising sea-levels, ecological performance, subsidence and running height of land, changes in climate and long-term effects to coastal ecology and activities of the people in general management area in the sea and the coastal area.

Environment degradation and water pollution: Marine environment and resources are being damaged due to current exploitation. Development of any fisheries livelihoods should take into consideration sustainability issues, such as waste pollution to the water source. The poor fishing communities think that "investment into aquaculture should not take into consideration the benefit in 5 years but longer than that", while other (Ha Tinh) people still continue to damage the environemnt though already acknowledge the risk.

There is increasing concern about the environmental effects of shrimp farming. Extensive cultivation has little the impact on the environment due to the small scale of production. Shrimpers are being encouraged by the government to restructure and reclaim land. Intensive cultivation, due to water resources needed and large quantities of waste, may cause environmental pollution (Ninh Thuan has a shortage of underground water for sand shrimp raising. People here often use underground water to meet their living and livelihood demands. This causes over exploitation of underground water, so that the water level is lower and its quality is gradually decreased. Also, in Ninh Binh water is polluted due to lack of infrastructure for inputs and outputs flows, in Tra Vinh and Ninh Binh the concern is salted soil). In order to achieve sustainable growth of the shrimp industry, comprehensive planning and sound mechanisms are required to safeguard the environment. Big investments are needed in terms of capital and technology for environmental

safeguards as well such as waste treatment on shrimp farms, irrigation systems and management. It is therefore the responsibility of local authorities to have master plans for land and environmental management to limit unplanned reclamation and over-exploitation of natural resources while promoting economic growth through shrimp raising. In the dry season, there is a lack of fresh water due to erosion of salt water into mainland; back water flow from cultivation areas but lack of proper irrigation causes aquatic environment pollution.

Run out of near-shore species due to over exploitation: The over exploitation can cause difficulties for fishermen. Their daily food sources from near shore catching are running out. Destructive fishing methods such as using poison and explosives threaten the lives of 85% of species and coral reef and also damage the biological diversity of mineral resources and fish species. Local seeds become disappear.

The following box provides a case study which illuminates the risks faced by the poor fisherfolks

Box 2.2 *: everyone says that prawn and crab farming bring big benefits, but would anybody become rich? Instead, they become poorer*

Both discussions (with two groups) in Village 1, Kim Dong commune reveal same reason for their poverty: their prawn, crab lagoon. Just 2 years ago, these farmers still grew rice, only some households prepared lagoon for aquaculture. From the latest crop, the whole commune got rid of rice and shifted to crab and prawn farming. The water drained inside channel is no longer fresh water but brackish water. Consequently, many households that have participated in aquaculture farming course had to shift their field into lagoon, ponds.

The reason is not clear: due to bad varieties or bad farming (they are not sure of both), prawn and crab suffer from diseases and die. The local people here face the possiblity of the next continuous crop failure.

Due to huge investment using large loans without getting back capital, these households suffer from huge debts. They said “if we had continued rice crop, we would have had plenty of rice in our house. However, now we can’t get any crab or prawn and have to worry for rice day by day”.

Now the fields have been turned into lagoon. They have to depend on that. If this crop is a failure, they will lose all their investment and their poverty exacerbated “crab go to the bank, my mother do not have any area for rice cultivation”.

2.3.3 Risks: Mitigation Measures

Among many mitigation measures, the poor fisherman suggested the following:

- Invest in a solid channel system (input and outputs) or water storage system for drought season (short and medium terms) if raising aquaculture.
- Support by "needs based" R&D for diseases and breeding and a nursery to help the poor fisherfolks to cope up with diseases.
- Encourage and support local initiatives to raise community awareness about the environment and complementary livelihoods (e.g. mangrove reforestation; rush/sedge, one fish – one crab);
- Improve the reservoir to ensure sufficient fresh water (in some provinces).

Chapter 3: Livelihoods opportunities for fishing communities

3.1 Traditional livelihoods: Current situation, constraints and opportunities

In general, people are doing diversification of livelihoods in coastal areas, and most of which are dependent on the natural resources. In assessing livelihoods in all selected areas and consulted communities, some factors for assessment and consultation include the (i) economic benefit (income generation for the poor), (ii) sustainability (pollution) of the environment, (iii) the availability of assistance (by the State, local government, financial assistance, technique, etc.) An overview of traditional livelihoods in consulted communities is provided for each province.

a) Quang Ninh:

The different natural characteristics of the areas (including both inland and coastal areas in two communes Duong Hao – inland and Quang Dien - coastal), there are a total of 17 livelihoods, namely: (1) Wet rice, auxiliary crop, (ii) Cattle keeping, (iii) Coastal fishing, (iv) Vendoring, (v) Seasonal hired labour, (vi) Fresh water aquaculture, (vii) Natural aquaculture, (viii) Clam, shell and molluse farming (ix) Collecting firewood, (x) Afforestation, (xi) Farming vegetables, (xii) Tea plantation, (xiii) Raft aquaculture, (xiv) Shrimp farming, (xv) Handicraft, (xvi) Mining, (xvii) Production of building materials.

1st Rank: Among all, the communities ranked fresh water aquaculture with the highest points. Even though fresh water aquaculture development is spontaneous and on a small scale, many of the poor households do not have access to sufficient capital. However, in the future poor communities put the fresh water aquaculture as the top priority livelihood, because it would bring sustainable income to overcome poverty especially while land becomes less productive for traditional agriculture production to generate income. There are several major advantages in fresh water aquaculture In fact, the present models prove that fresh water aquaculture has an income of 4 – 5 times higher than wet rice cultivation. Also, fresh water aquaculture would have a minimal affect on the environment. However, difficulties related to aquaculture livelihoods are seen in utilization of good sources of food/inputs, and the input costs have been increasingly high.

In some coastal areas, the fishery communities gave high attention to clam, shell and molluse farming. This kind of livelihood does not require large investment in facilities but only in seedlings; hence it is highly favorable for the poor owing to the utilization of available sources of feed. However, similar to the fresh water aquaculture, without assistance in credit or capital or good seedling/nursery, this model seems still difficult for the poor.

2nd rank: Wet rice and auxiliary crops remained the traditional livelihood in these communities. However, due to the unfavorable conditions (dependent water supply, high input costs) as well as low productivity due to soil degradation these livelihoods are only sufficient for family food consumption.

3rd rank: Cattle farming is an alternative traditional livelihood. However, the poor said that they lack capital and knowledge in buying breeds and preventing diseases.

4th rank: The near-shore coastal fishing gains highest points over creating income and creating jobs for lots of people but there was high environmental concerns due to uncontrollable, unplanned and unmanaged exploitation causing threat of depletion of resources, therefore this livelihood in its current form is not so highly appreciated. In spite of this shrimp farming and raft aquaculture would create high incomes, but it is unsuitable for the poor due to the high investment and good technology.

Amongst others, the poor are doing hired labour that brings about regular income but still is unstable in terms of job demand. However it remains the choice of lots of households, especially the poor ones with limited resources like land and capital.

b) Ninh Thuận

The selected areas are both coastal communes (Phuoc Dinh and Phuoc Diem) and they have many in common. However, through the consultation it was possible to distinguish the difference in livelihood between men and women for two communes. The people consulted focused on opportunity for income generation. Findings reflected that the poor people with no land or capital always go for hired labor and catching the natural species in the sea shore for livelihoods. The opportunities will be open for women and men if they have capital, they can do some complimentary businesses to fisheries like producing fish sauces, and seaweed drying (post-

harvest). The middle poor can normally be involved in aquaculture with the condition of having land and capital. The following table helps to see livelihoods by groups in detail.

Table 3.1. Livelihoods by men and women groups in Ninh Thuan

Order (in terms of income)	Thuong Diem Village (Phuong Diem)		Truong Vinh Village (Phuoc Dinh)		Remarks
	Women	Men	Women	Men	
1	Hired labor	Hired labor	Collecting gracilaria	Diving for lobsters	Poor, no capital, no land
2	Vendoring	Producing fish sauce	Collecting sea grass – sea weed drying	Inshore fishing	Poor, with some capital
3	Pig raising	Cattle keeping	Fishing for sea shells	Cattle keeping	Middle poor, with some capital
4	Sea grass farming	Aquaculture	Hired labor	Aquaculture	Middle poor, with land and capital

c) Ha Tĩnh

The selected consulted areas are two districts: Thach Ha (Thach Hai and Tuong Son Communes), and Can Loc (Thinh Loc and Vuong Loc Communes). In Can Loc district, Thinh Loc commune: Livelihoods vary from agriculture, seafood fishing, making herbal medicine, or working out as hired labor in other provinces. A small number of well-off people choose to work overseas. While in Vuong Loc commune, a low land area, agriculture is the main source of income of the households (80%). Handicrafts and trade account for a very small amount (only 4.8% and 15.2% respectively). Livelihoods in the table below show that the poor ranked highest the coastal fishing. 90% of households living in coastal areas are doing this livelihood since it is "easy going" and provides a relatively high income. However, 100% of households still do agriculture. This means that agriculture and coastal fishing are the two main livelihoods to ensure the income and food security for the poor. In the low land and land locked areas like Can Loc, aquaculture seems not yet be attractive to the poor because there is still lack of capital, high price of bidding land for lagoon, and lack of market for the products.

Table 3.2 Livelihoods in Hatinh

No.	Livelihoods	Income	Remarks
1	Fishing (coastal fishing) 90%	100% male with average income of 1,000,000 VND/household/month	(about 5-6 worked months per year), labour age
2	Sea food processing (fish sauce, dried fish, dried shrimp, shrimp paste)… 90%	100% female, mostly for family consumption	A processing model has been set up (4 models = 4 households) 5-6 processing units
3	Vending (Convenient stalls in markets and villages) 50%	Average 200,000 – 300,000 VND/month	Year round
4	Agriculture (cultivation and animal raising) 100%	Cultivation (about 200,000 VND/year) Animal raising (around 500,000 VND/year)	Cultivation (infertile land, large investment) Animal raising (Higher income, year round)
5	Oversea work (South Korea, Taiwan, about 25 people)	Average income of 15 – 20 million/year)	
6	Extra work (construction) about 10 people	30,000 – 35,000/day (without food)	Seasonal (idle time, rough sea) Dependent
7	Aquaculture (15 – 20 ponds) including private ones	Average 500,000 VND/year	One household has tendered ponds of 500m2 Re-tendering on 3-year basis Catfish, butter fish, carp, anabas, amur, chub

The poor need to have a way out of the poverty, from their traditional livelihoods. The poor are facing many difficulties that constrain them from large scale and sustainable livelihoods. Most of the poor consulted mentioned the lack of investment. They still cannot access the credit facilities, which are supposed to be available by the official banking system like Policy Bank (VBARD) at all levels. The inputs and output factors like seeds, technical know-how and market access respectively represent frequent difficulties. The poor would need concrete support to mitigate any possible risk

like losses due to disasters or poor quality of seeds or lack of knowledge of production. They would need to receive training, capital and especially infrastructure which require big investment from the local government. The table below describes difficulties and measures by each category of livelihood.

Table3.3. Difficulties of traditional livelihoods for the poor in Ha Tinh

Type of Livelihood	**Risk/Difficulty**	**Mitigation measures**	**Proposed assistance**
Agriculture (making up 80% of the total income)	- Weather (disease) - Water resource for production (2005: lack of water supply for 45 hectares) - Quality of seeds - High input costs - Infertile land, saline soil	- Provision of 3 pumping stations - Setting up of nursing field - Rehabilitation of salt water prevention dykes - Technical guidelines (Schedule for crop)	- Credit assistance (low interest rate, long-term loans) Re-planning of land stock, land which is not suitable for cultivation should be turned into aquaculture
Aquaculture	- Disease -Natural disasters (highly risky) -Lack of capital/investment - Lack of Infrastructure - Lack of Consumption market - Lack of seeds (high price) - Lack of technical information	- Delayed taxation (incentive for development) - Training	Assistance in providing high quality seeds Credit provision Investment in development of infrastructure (construction of channels, pumping stations, salt water prevention dykes, flood relief culverts, roads, inner field roads)
3. Extra work: Brick laying, worker. Fishing in unplanned	- Unsustainable (in terms of both work demand and income)	No mitigation-measure yet Market to be fostered	- Funding (access to large loans) - Planning and rehabilitation of infrastructure

ponds and lakes in nature			- Training on technique + experts in the field of aquaculture - Pilot model - Assistance in finding market,
4. Animal raising: pigs, cattle	- Disease - Market price (output) - Unavailability of cattle studs - Funding - Feed (no land for grassing) - Infrastructure for animal raising	- Assistance in vaccination - Policy to improve the cow and pig livestock → Not yet commenced due to lack of funding, technique and	- Construction of farms, household's stalls - Technical Training - Credit for the poor - Consumption market

d) Trà Vinh

In Tra vinh, poverty incidence has been high in consulted communities especially among the ethnic minorities. Also the poor face difficulties in doing their traditional livelihoods like rice growing, vegetable growing or animal husbandry (pigs, cows). The consultation allows us to see that the traditional livelihoods are becoming less important, as they are not creating high incomes and jobs in the area. Poor fisherfolks still lack jobs during low seasons. And for traditional livelihoods, the most difficulties are (1) lack of funds for production, (2) no skill and (3) no land for production. The communities said that the poor who have no land can raise cows (pig and fowls) and offer hired labour. People remain in poverty also for other reasons like low educational level. (Refer to box 2.1)

Table 3.4 . Livelihoods activities of the poor (in order the important level from 1 - x)

Livelihoods Models	**Income**	**Job creation**
Shrimp farming	1	2
Oyster farming	6	7
Crab farming	6	6
Pig breeding	3	3
Cow risng	5	5
Poultry keeping	9	8

Rice growing	2	1
Planting fresh vegetables, crop	8	8
Hired labor	4	4

The poor fishermen in Hiep My Dong and My Long Nam communes found the shrimp farming attractive as a way out of poverty as this livelihood has created high incomes and employment opportunities for them. However, the poor fishing communities here have recognized that they need to diversify their livelihoods, in both large and small scale. However, they should have their own land and equipment. Those who have little land can: (i) Cultivate rice - auxiliary crops + Raise cattle and (ii) Cultivate auxiliary drops + Offer hired labour. Current cow raising for the poor is being used. Some people can pursue a combination of livelihoods in order to escape from poverty such as offering hired labour (practicing thrift) -> to purchase pigs and cows -> To purchase land -> To cultivate rice/auxiliary crops/shrimp

Box 2.3. Poverty- exit experiences from the women in Cai Gia Ben village– Hiep My Dong

Ms Ngo Thi Lien's family has 5 members, with three small children so there are only two labourers. Before 2001, they had only 0,5 'sao' land plot for vegetable cultivating. They lived on hiring their labor to other well-off people. However, they had enough food for six months of the year, and were hungry for the remainder. In 2001, they borrowed 3 million Dong to buy a cow; after 12 months, it delivered a baby buffalo and so they could sell it for 2,5 million VND. They invested this money in production. In 2004, they sold both mother cow and calf with for a price of 8 million VND to pay their debt, redeemed a land plot mortgage (1,5 million dong), dug a water well and bought equipment to irrgate (2 million VND). Rice cultivation could then give them an average of 500 – 700.000VND/month. The family started a fish and shrimp pond in their 1 land plot)

e) Ninh Binh

In Ninh Binh, the local people are involved in all kinds of livelihoods, as a typical Red River Delta area, ranging from rice growing, cattle (pork, buffalo, cow) and poultry raising, and handicraft. Rice and sedge cultivating[7] is followed by handicraft. Making use of the labour in the leisure time after harvested crop and the available source of materials, the people of Kim Son manufacture many handicraft products such as sedge mat, sedge sandals, sedge bags. Although this is not the key production but working in the handicraft trade plays an important role in handling the redundant source of labour and bringing a regular income for the people of Kim Son. The area has had

[7] Sedge is one type of tree which grow on salted land, used for handicrafting

favourable natural conditions for agricultural production for long time because of the rich fertile land of the estuaries. However, Kim Son area are facing the difficulties because of downgraded environment (polluted water, increasing salt level in soil), which impacts much on the main livelihoods such as rice cultivating, aquaculture raising.

Brackish aqualculture seem to attract quite a few number of people (table 2.6), including the poor. However, water pollution because of a lack of inlet and outlet system became the big problem. Brackish aquaculture requires large volume of fresh water to regulate the salt levels, but it is also difficult for other poor people who are doing their traditional agricutural livelihoods like rice growing because the salt water used for aquaculture seeps into the field and contaminates the soil for crops. The trend for aquaculture raising is also growing very fast. The people of Kim Son have an saying, "Nowadays, rice-fish enroach sedge ponds enroach aegiceras, aegiceras enroach the sea".

Table 3.5: Participation of the household in their livelihood options

Principal and secondary Livelihood	**Estimated households participate in the livelihood (%)**		
	Kim Sơn district	**Kim Đông commune (coastal)**	**Binh Minh commune (inland)**
Aquaculture farming	50	50	2
Catching sea natural aquatic species	35	2	n/a
Planting rice	90	-	80
Planting sedge		-	20
Breeding animal and poultry	70	50	80
Business, services	5	3	15
Handicraft	5-10	20	40
Working - out	5-10	40	5

3.2 Alternative livelihoods for poor fisheries communities

The poor fishing communities are also involved in some other activities related to fishing and aquaculture besides their traditional livelihoods. Among other kinds of alternative livelihoods considered now as a way of moving out of poverty are: fresh water fish, combined fish-rice, molluse and oyster or seaweed raising. It seems that the people already recognized the bad effect of natural resource exploitation through some kinds of livelihoods like brackish shrimp raising, hence this livelihood does not rank high. The poor do not also prefer near shore fishing. Instead, the combination of livelihoods seems to be the selection. There is always one alternative for the people to take advantage of the natural resource and to minimize investment, given some shortage of capital. For these alternative livelihoods, some selection will be elaborated further in section 3.3 – the priority by the fishing communities.

Table 3.6: Participation of the household in their livelihood options

Rank	Quang Ninh	Ninh Thuan	Ha Tinh	Tra Vinh	Ninh Binh
#1	Fresh Water fish farming	Cattle farming	Fresh water aquaculture	Sea crab in mangrove	Rice-fish – (fresh water)
#2	Molluse farming	Seaweed raising	Rice + cattle raising	Oyster raising	Brackish water fish – shrimp/crab raising
#3	Cattle farming	Fish sauce processing	Near shore fishing	Cattle farming	Rice –Sedge
#4	Hired Labor	Near shore fishing	Aquaculture processing	Hired Labor	Off-shore oyster farming (future)

- **In Quang Ninh,** although the traditional livelihoods also bring income, due to unfavorable production conditions the people have been moving to more fishing farming or cattle farming. The coastal fishery like molluse raising attracts the poor people.
- **In Ninh Thuận:** Cattle farming livelihood (sheep, cow, goats and pig) is seen like good alternative to traditional rice growing. However, with the reason for diversification, the people started to do some seaweed raising (also in cage) as with relatively reasonable investment. Fish

sauce production is ranked the 3rd livelihood alternative. In some village like Phuoc Diem fish sauce production has been a tradition livelihood. Fish sauce is currently the livelihood of rich households. However, poor households still have approach if they receive proper initial capital assistance. Although some other livelihoods such as near coastal catching (fish, prawn) bring good income for poor people, they are not sustainable. The Fishery law prohibits exploitation of coastal resources.

- **In Ha Tinh,** the choices of alternative are quite similar to Ninh Thuan, with prefered Aquaculture, especially fresh water farming and fish-rice combination. Cattle keeping and aquatic products processing are helping the poor out of poverty. Aquatic resources for livelihoods like near-shore catching, natural fish catching, inland molluse farming and rice-fish combination models are extremely important livelihoods for poor households as they only require small investment but generate high income.
- **In Tra Vinh, although there is new but good choice:** oyster raising, a combination alterative like crab in mangrove is in pilot. This means of livelihood both uses and protects natural resources. See further table 3.7

Table 3.7 Livelihoods options for fishing communities in Tra vinh

Livelihood Option	**Participation of the poor**	**Advantages**	**Disadvantages**
Specialized shrimp hatching	The poor participate as hirer	- High value - High biological productivity - Large output - High benefit	- Large capital - Strict requirement on techniques - Needing large area, good infrastructure. - Difficult for the poor to access - Much risk - Bad effects on environment - Unsustainable. - Poor competition
Alternated shrimp raising (1 rice + 1	Some of the poor	- Average value - Exploiting natural shrimp - Rather high benefit	- Good irrigational system - High technique to

shrimp/fish)		- Not impacting much on environment - Low capital - Normal requirements on technique - Suitable with the poor with little land	resolve bottom layer - Only suitable with characteristics of each small zone
Oyster raising	The poor participate in supporting projects	- Eligible - Easily to raise and take advantage of natural products – stable price - Normal capital	- Protection has many difficulties
Inshore fishing	The poor only fishing themselves or working as hirers	Average income	Aquatic resource is becoming short Destroying environment because of using chemical substances
Fresh-water fishing	Many of the poor participate	Average income Low investment	Instable
Afforest in salty zone combining with raising natural aquatic products	The poor can participate if funded with capital	Protecting environment High benefit Sustainable model Diverse aquatic resources	Requiring large capital - Only applying to coastal limited area - Difficult to protect aquatic resource

- **In Ninh Binh,** with the risk of environmental degradation and the loss of productivity in brackish aquaculture, people tended to move to fresh water aquaculture for alternatives. This fresh water aquaculture can still be combined with other agricultural livelihoods like 1 rice-1 fish. This way reduces risks and diversifies incomes for the poor.

Table 3.8. Comparison of available preferred livelihoods in Ninh Binh province

Model	Favourable areas	Economic efficiency	Sustainability
Rice - sedge (alternative)	The whole area inside Binh Minh 2 dike .	- Minor investment - Rice do not bring high income (2 mil/ha/year) due to limited productivity and land area, however, rice can be easily consumed and stored. - Sedge is of high economic value (three times higher) but heavily dependant on market price.	- These 2 livelihood are quire sustainable thanks to high replacement possibility and environmental sustainability (if flora protection insecticides are used properly). - Water for rice crop should be fresh water. Sedge can grow with water with salt portion of up to 5%. - Rice : 2 crops/year Sedge: 1 crop for harvesting in 7 years.
Rice – fresh water fish (combination)	The depressed field area inside the dike	- Minor investment - Rice: as above - Fresh water fish: has higher economic value and low cost investment in comparison with rice, consumed in local market.	- The transformation of depressed field into field+fish pond enables application of 2 crops/year instead of 1 crop (as field level is higher). - Fish is kept in locked water, therefore, water consumption is not high.

3.3 Livelihood priority for the fishing communities

The table below describes the priority selection by the poor fishing communities by each province consulted.

Table 3.8 The priority livelihood choices of the fishing communities

Province	**Selected livelihoods/models of coastal communities (*)**	**Constraints**	**Selected livelihoods/models of inland communities**	**Constraints**
Quang Ninh Hai Ha	**Quang Dien commune**: - Freshwater fish rearing (in-dyke area): 1st priority; - Oyster and mollusc (tidal zone): 2nd priority.	*Lack of Government control: seeds* *Weak Market* *Storm and soil downsliding* *Exploitation of near shore resource – deplotation of resources*	**Duong Hoa commune**: - Freshwater fish rearing (in-dyke area): 1st priority.	*Lack of technical guidance* *Lack of infrastructure* *Often Flooded* *Salted underground water*
Ninh Binh Kim Son	**Kim Dong Commune** -Brackishwater fish/shrimp/crab farming (alternatives): 1st priority.	*Lack of inlet-outlet channels – water polluted* *Diseases* *Lack of good seed* *Lack of technical assistance/extension*	**Binh Minh commune** - Freshwater rice-fish farming (combination):1st priority.	*Salted soil, degradation of soil*
Ha Tinh Thach Ha	**Thach Hai Commune (**)** -Freshwater fish rearing: 1st priority.	*Lack of infrastructure (dike and inlet-outlets flows) and proper zoning* *Lack of high quality*	**Tuong Son Commune** - Freshwater fish rearing (fish-rice): 1st priority.	*Lack of capital, technical assistance*

Province	Selected livelihoods/models of coastal communities (*)	Constraints	Selected livelihoods/models of inland communities	Constraints
Can Loc	**Thinh Loc Commune** - Fish rearing in pond (freshwater): 1st priority; - Fish-rice farming (rotation): 2nd priority.	*seeds* *Diseases, hazards* *Low awareness to protect environement* *Market*	**Vuong Loc Commune** - Fish rearing in pond, lake (freshwater): 1st priority; - In-field fish farming: 2nd priority.	*No market*
Ninh Thuan Ninh Phuoc	**Phuoc Dinh Commune** - Inshore farming of E.Cottonii seaweed: 1st priority. **Phuoc Diem Commune** - Inshore farming of E.Cottonii seaweed: 1st priority.	*Lack of capital, infrastructure, knownow (raising and post harvest)* *Low and fluctuated Price* *Risky due to environment, diseases*		
Tra Vinh Cau Ngang	**My Long Nam Commune** - One rice-one shrimp: 1st priority, effective -Tiger prawn farming: 2nd priority .	*Environment degradation* *Lack of capital, technical, extension, infrastructure* *Fluctuate price* *Diseases*	**Hiep My Dong Commune** -Tiger prawn farming: 1st priority -	*No land* *Lack of capital*

Note: (*) *Selection is based on 3 criteria (i) Economic benefit (income generation) for the poor (both presently and in the future); (ii) Sustainability (including social and environmental aspects); (iii) Availability/ Feasibility of supports (from central and local government, Donors, and Technical Assistance).*

(**)Thach Hai commune is the coastal commune but some villages are located by the beach. Some villages are located as inland coastal and not close to the sea. The inline coastal areas have a river and a lake, so the freshwater to be selected as potential livelihood.

a) Quang Ninh:

- Fresh water aquaculture livelihood (fish raising) can be considered one among the best choices under the current conditions of 2 selected communes (Duong Hoa and Quang Dien) is considered as 'livelihood for the future' if proper assistance (knowledge transfer, quality of seed, capital) is provided.
- Raising species like oyster, molluse in the coastal commune (Quang Dien) is also desired by the poor fishing communities. This livelihood does not require big investment in seed and infrastructure. Therefore it is quite convenient for the poor people. If capital assistance for varieties procurement is provided, this model can be developed by the poor people.
- Cage shrimp and fish farming bring about relatively high income. However, as this type needs large investment and advanced technology, for the time being, poor fisherfolks do not consider it very suitable for their current situation.

b) Ninh Thuận:

- Aquaculture is the best livelihood choice for fisherman communities, especially poor people in the future. Aquaculture of algae (rong sun): grows to be a good choice in both two surveyed communes. However, its constraint in farming cartilage algae is the risk of climatic conditions (wind, storm and being food of the fishes). These risks can be limited by applying cage farming techniques.
- Cage fish, shrimp keeping: this livelihood also brings about high income for the fisherman community. In the long run, this livelihood can take advantage of the natural potentials of the coastal area. However, this livelihood requires large investment and modern technology. As such, it is not suitable for poor people at the moment.
- Shrimp varieties/ nursery raising generates very high income but only for the richer fisherman groups. The poor fishing community can not do this livelihood.

c) Hà Tĩnh

In the coastal area of Ha Tinh (Thach Ha district) the choice of fish –rice and fress water fishing as 1st livelihood for income generation and sustainability was also the dominant view of those consulted. The priority for inland is fresh water fishing and in-field fishing farming. However, the

constraints encountered by people are: weather (flood), high temperature, lack of capital, varieties, accessing markets for products, techniques – practice, shortage of capital for lagoon improvement, techniques, varieties, output (market information), drainage and intake system.

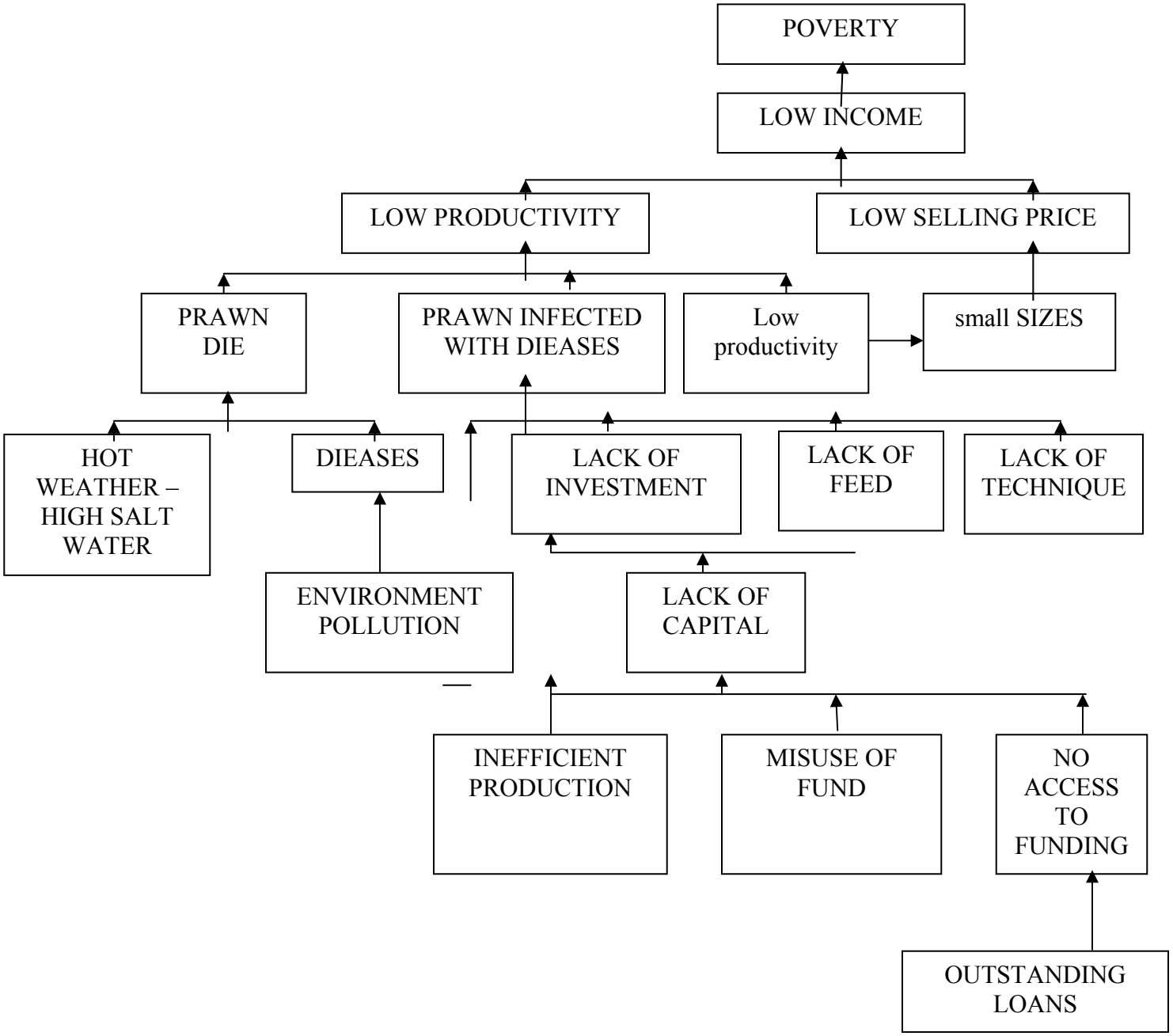
As such, to improve productivity and economic efficiency, the local people have prioritized their needs in the following order:

- Construction of intake channel (1)
- Inter-hamlet roads (2)
- Establishment of typical aquaculture area (3)
- Techniques for cattle farming and aquaculture (4)
- Capital aids (5)
- Construction of sea-water prevention dike (6)
- Varieties (7)\
- Loan provision (3)

d) Trà Vinh

Aquaculture is not the first livelihood choice of poor people in the selected poor communities in Tra Vinh. "One rice – one shrimp" becomes the 1st priority in coastal areas. Those living in the coastal area also want to integrate aquaculture and agricultural livelihoods. Some shrimp raising models although they bring high incomes are not the `1st priority because they require considerable investment and advanced techniques and also carry greater risks. According to the poor people's viewpoint, their capability in development of oyster raising, a model considered to be suitable for the poor, is also limited. The challenges mentioned are: (i) Shortage of capital for varieties, food, (ii) lack of infrastructure for farming on offshore warp (iii) Poor fisherman can not afford to pay a protection fee and (iv) risk easily occurs.

Chart 2.1 Problem tree in Tra Vinh with shrimp raising by the poor fisherfolks



e) Ninh Binh:

Since the beginning of use of coastal alluvial warp in 2001 up till now, the aqualcuture area has been increasing continuously. Increasingly, all people in Kim Dong commune, a commune located in between dikes (Binh Minh 1 and Binh Minh 2), have abandoned rice land plots to shift to brackish water aquaculture ponds, which were ranked the 1st priorty in coastal areas. In inland area, the combination of rice – fish is the 1st priority. In Ninh Binh, the combination of livelihoods (aquaculture – agriculture) seems to be the best choice to benefit from natural resources and also income generation must go with food security. However, the difficulties for communities in Kim Son distric of Ninh Binh to develop aquaculture livelihoods are reflected, including;

- No zoning in development of ponds and lagoons together with lack of inlet and outlet system that creates epidemic deseases due to unhygienic conditions
- Poor quality of variety/seed because there is no extension and quality control by the local government extension system, while there are no nursery producing stations in local area.
- Lack of technology, knowhow and knowledge
- Aquaculture needs bigger investment than common practice of rice crops or other crops while poor households do not have access to credit assistance from the banks.

3.4 Livelihood model for the poor fishing communities with investment needs

The model and recommendations from the poor fishing communities will be described by each province. As mentioned, each province can develop the inland (fresh-water) aquaculture as well as near – shore fishing or brackish water aquaculture. This allows the province to diversity the livelihoods. However, each province, among their priority choice of livelihood, recommends the most suitable livelihood model for the poor fishing communities in this section together with some recommendations. In general, the options with low investment are chosen, with a condition of proper credit scheme, training on know-how and techniques for aquaculture livelihoods and access to high quality seeds and extension support, as well as proper infrastructure system are among the most important recommendations.

a) Quảng Ninh

Reference to the Master plan for aquaculture development of Hai Ha district for 2006-2010[8] and people's and local officers' views.

For inland area: a combination of rice - fresh water fish farming for low-efficiency agricultural land (inside dike of Duong Hoa and Quang Dien communes) is recommended**.** Fresh water fish farming received the highest response from the poor. But poor households lack necessary capital to apply this model. It is promising because it still does not require big investment, neither does it create environmental burden.

For coastal area (or near shore), oyster and molluse raising, this is highly recommended by the poor fishermen because it does not require large investment in infrastructure. Oyster and molluse aquaculture raising brings high income for fisherman and the coastal natural resources can be preserved properly and sustainably.

Although fresh water fish farming or near-shore farming like oyster, molluse raising bring much higher income in comparison with traditional agricultural production, the poor people can not participate in shifting to this model due to (i) shortage of investment capital (ii) lack of farming techniques to monitor and prevent epidemic diseases (iii) lack of solid infrastructure system for aquaculture (dike, dam, sewer, channel, road, electricity), (iv) lack of water in dry season due to lack of irrigation supply system. Water shortage occurs in 3 months in place with soil channel, thus, local people have to sell immature fish.

The recommendations from the poor fishing communities on their existing problems include;

1. Provide credits for household groups for a period of 2 years, loan amount 25-35 million/household with favorable interest
2. Provide assistance for establishment of fresh water fish varieties production (following the province's fishery master planning)
3. Provide trainings on fish farming skills, epidemic diseases prevention (including medicine cabinet for aquaculture at hamlet level)
4. Establish the fishery extension network (on aquaculture) at hamlet level

b) Ninh Thuan:

For coastal area: Further development of aquaculture in inland area (like shrimp raising in sand land) is not encouraged now as it has created many problems including (i) risks due to diseases (ii) shortage of underground water (iii) big investment

[8] prepared with technical and financial assitance from SUMA

For inland area: Seaweed is considered 1st priority livelihood (alternative)

From the feedback from the fishing community, as well as the current situation on aquaculture development, it is recommended that the livelihood for poor fishing communities in inland area should be promoted. In particular, assistance for demonstration of cage seaweed farming as a pilot alternative livelihood with small investment for poor fisherfolks is recommended.

The main recommendations for implementation are as follows;

(i) reinforcement of management capacity of aquaculture staff at province, district level (through training on management skills and techniques),

(ii) reinforcement of fisherman community awareness on livelihoods and environment/natural resource management

(iii) A form of credit which is suitable to the fisherfolk situation i.e. catching and selling, self help group or in the form of cooperative/group credit

However, in order to implement the pilot project or needed in the proposal of the coming project, further study in a form of real PRA on household poverty and economic structure will be required.

c) Ha Tĩnh

In coastal area, aquaculture is given the 1st priority: including fresh water fish farming () with a combination of

(i) aquatic catching + aquaculture raising + agriculture + aquatic product processing and/ or

(ii) Agriculture + trees planting (pine, casuarinas, cajuput, etc) in the sandy land by the coast.

In inland area, rice-fish combination model is now widely developed as a good alternative with small investment and low risk.

Nowadays, aquaculture raising is seen to be important as it is reflected that the marine natural resources have been depleted gradually.

Box.3.2. Comparison of inland aquaculture and off shore coastal fisheries

- Investment level: The investment in livelihood in coastal area is normally higher than the inland area. (i.e. ship and vessels, plot making cost is much higher than making ponds and lagoon)
- The interest rate for aquaculture raising (short term) is higher than the fish catching (long term)
- Aquaculture raising in inland area meet less risks by natural disaster (and storms) but meet more risks by diseases
- The aquaculture raising attracts more labor than off shore fishing, where both men and women

can participate in livelihoods.

- The aquaculture development attract more poor households than the off shore catching/exploitation

The development of aquaculture (prawn, fish) will boost the development of various other services (supply of varieties, food, products consumption, preliminary treatment service). Thus, large amounts of labour will be needed. However, huge investment is needed for aquaculture (for a 3 ha lagoon: construction of infrastructure – lagoon embankment, water circulation, procurement of varieties, food... it cost around 250 million VND for extensive farming) whereas high risk is encountered due to unpredicted climatic conditions and shortage of aquaculture knowledge. A formation of enterprise or cooperatives for aquatic product processing is also a model that needs investment and assistance in the future. This livelihood will attract large number of poor female labour and bring a relatively acceptable income for poor people in the coastal area.

Box 3.3. People in Ha Tinh propose their needs to ensure livelihood in the following priority order (according to priority order xxx-1):

- Channel construction (1)
- Inter-hamlet road (2)
- Establishment of pilot model for aquaculture (3)
- Cattle breeding and aquaculture techniques (4)
- Loans (5)
- Construction of salty-water prevention dike (6)
- Varieties (7)

d) Ninh Binh:

*Diversification of livelihoods and safeguards to enviromental and social sustainability is the choice for fishing communities in Kim Son district (see table (*all households in Kim Son maintain at least two activities currently). *As* mentioned previously, each livelihood has its own natural and social advantages or its own constraint. As almost all of the major livelihoods belong to agriculture and fishery, non-agricultural activities only constitutes a minor portion, difficulties in production usually originate from natural and socical conditions. The poor people, however, can get used to livelihoods that requires negligible investment and depend on labour, such as agricultural and handicraft activities.

The difficulties, among others, encountered by the fishing communities to do the aquaculture livelihoods include

Aquaculture needs huge investment. The poor can not borrow sufficient funds for the aquaculture raising (especially shrimp and crab) – see box 3.4 and box 3.5

Box 3.4. Costs of one aquacultural model (unit: 1 hectare of lagoon/pond) in Ninh Binh
Lagoon/pond excavation: 10 million VND
Inside-lagoon channel : 1 million VND
Irrigation fee : 180.000 VND
Inside-lagoon channel management and maintenance: 66.000 VND
Varieties : 5 million (prawn), 15 million (crab)
Food : 6 million VND

- aquaculture requires advanced techniques but the poor fishermen do not have adequate knowledge and training.
- Aquaculture (especially the brackish) encounter numerous risks including the losses due to diseaseas and water pollution
- Poor people can not access to resources such as lagoon land[9]

Box 3.5: 1 mm wrong choice, 1mile far to correct

Mrs Nguyen Thi Gam and family have lived in hamlet 1, Kim Dong commune since 1993 (decision on commune foundation issued in 1998). On an area of 1.75 ha, they grow 01 rice crop, plus breeding and knitting. Although they do not have any savings, production plus some income from employment of Mrs Gam's husband is sufficient for the whole family's life.

At the beginning of 2005, upon hearing that crab and prawn farming would generate high income, Mrs Gam's family decided to abandon rice cultivation. With an amount of 4 million (loan with interest of 5% in 7 months), they turned 1.75 ha of rice field into lagoon and raised prawn. Upon harvest of the 1st crop, and discovering that the amount from prawn sales was just sufficient for farming investment plus interest, they shifted to crab farming.

Investment for crab farming is higher than that for prawn. The Bank for Agriculture and Rural Development lent 15 million. Due to loss caused by storms and epidemic deseases, at the end of the crop, the number of remaining crabs was quite small, thus, they could not get much money and cound not clear the debt with BOARD.

At present, apart from the said unpaid debt, Mrs Gam's family have difficulty in deciding how

[9] the division of coastal plain land into ponds, lagoons unintentionally turns coastal aquatic resources from community property into private property. All the alluvial warp are under government ownership or army units, local people in Kim Son are not allowed to carry out catching in this area.

to proceed. They do not have capital for further investment in aquaculture. They can not pay interest if they get loan from outside. Also it is impossible for them to get another loan from the Bank as the current debt has not been cleared. They can not grow rice as before because all the field area has been turned into pond which has been contaminated by salty water. Transformation needs time and also investment..

In order to implement the livelihood models that are suitable for the poor fishing communities, the key recommendations from the communities include;

- Kim Son district needs to prepare a master and detailed plan for each area, together with plan for maintenance and development of livelihoods to ensure stability and sustainabiliy of livelihoods
- Diversification of livelihoods which is the combination of aquaculture and agriculture (like rice – fish model) would be suitable with household's capacity and financial situation
- Investment in infrastructure is essential to ensure water flows and to reduce water pollution in case of raising aquaculture
- Production of seed is needed locally
- Training of fish farmers on aquacultural breeding (especially in case of shrimp and crab farming)

d) Tra Vinh:

In Tra Vinh, inshore aquaculture was a key livelihood for the poor fishing communities especially in the coastal areas though it seemed that the better-off participate more in these livelihoods than the poor.

Livelihoods	Participation	
	Group of non-poor	Group of the poor
Raising industrial shrimp: have to own	+++++	++
Raising oysters	+++++	++ (the poor have little land) the poor have no land, only hired in digging, building up dikes.
- Raising sea-crabs in salty forests	+++++	++

- Raising oysters in shrimp ponds - Raising fresh-water products	+++++ +++++	++

The poor fishing communities have many difficulties in undertaking aquaculture activities (see table 3.9)

- The poor lack capital
- The poor lack technical knowledge, (crop calendar, producing procedures, preventing and curing epidemic diseases)
- The poor has less chance to participate in long term projects

Table 3. 9 Comprehensive Analysis of Prawn Raising

Strength	Weakness	Advantage	Threats/Risk
- High value - Highly biological productivity - High benefit/income	- Large investment - Strict technical requirement - Unsustainable. - Weak competition capacity - Capital shortage - Lack of Skills and experience - Underdeveloped irrigational system - lack detailed planning - Underdeveloped services. - Bad management of variety -	- Possible to combine growing rice and raising prawn - Land-use-right is assigned - Surplus labour - Extended domestic and international market. - Supported by staffs of aquaculture extension - Receive priority policies	- High risks - Bad effects to environment - Ragged land - low awareness of community - barrier of commercial liberalization and integration - Polluted environment - High price of electricity, medicine - Instable price of prawn - Unhealthy competition. - Much epidemic

In Tra vinh, the poor fishing communities have been supported in several ways. Communities in the selected areas also received support from NGOs, as a pilot feasible and suitable approach. Various models (in My Long Nam commune) are described as follows;

Model of raising industrial shrimp –Thang Loi Cooperative

+ The collective under District People's committee, has now 84 members with the area of 20.83 ha including raising ponds, accumulating ponds, wasting ponds and drainage.

+ Selling stocks for members: 1.000.000 VND/ stock

+ Organization: Administrative board, monitoring board

+ Technical board: 3 university graduates in aquaculture

+ Supply of variety+ techniques: centre of aquaculture extension

+ Total mobilizing capital: 3 billion dong

+ Fixed capital: 9 ha land with contributions of share holders (1.3 billion dong)

+ Output market: Aquaculture Firm of Tra vinh province that to buy/consume the products from the farmers.

Model of oyster raising – Thanh Cong Cooperative

Implementing method: Forming Cooperative to assign land to people, funding for buying varieties (7 million dong/ household)
HHs contribute monthly guarding fees based on assigned land

The participation of the poor is very limited due to corresponding capitals (monthly they have to contribute between 50.000- 100.000 VND) is a challenge to poor HHs with unstable incomes.

Groups of agricultural extension are established with voluntary members with high responsibilities and Group "Determination" model.

Inter-group and inter-village activities have diverse content: technical training, visiting, sharing experiences, supporting HHs in risk. High self-awareness and discipline ensure usual activities.

The recommendations from the poor fishing communities to overcome their weaknesses and threats include;

- Diversifying incomes can ensure sustainable poverty riddance for the poor in coastal areas and no destroying environment and aquatic resource.
- Access and ownership of land is really a sustainable means for them.
- Poor women themselves need to have their sustainable livelihood activities,

Model	Advantage/ Effectiveness	Recommended Assistance
Mangrove forest's cultivation in	- The inshore alluvial ground is diversified and plentiful. - Experience gained from forest	- Provide credit (period is 5 years, preferential interest, average loan level is 20-25 millions VND per house hold

combination with natural aquaculture's cultivation	destruction, the communal understanding about the role of mangrove is raised. - The project of mangrove forest's cultivation is supported by World Bank. - aquaculture and forestry as the two main sources of income - Strengthening the sea security/disaster prevention	which is enough to cultivate 1 ha of forest, to buy aquaculture varieties/seeds) - Furnishing seeds, - Techniques to combine tree-aquaculture (Mangrove, cajuput, crab, shell, honey bee, etc, - -Strictly reinforcing administration and protection of forest
Mollusc cultivation	- Suitable to features of territorial water areas - High economic value. - Products are easy to be consumed in the domestic and foreign market. - Less risky, the level of stability is high. - Big profit -	- Provide suitable credit scheme (a loan period is 2 years, preferential interest, average loan level is 10 millions VND per house hold which is enough to cultivate 1 ha of lagoon - Strengthen sea protection - Offering practical solutions to minimize unexpected natural hazard. - Develop aquaculture extension service at communal level.

The following table summary the proposed livelihood options as all described above. Only proposed livelihoods where the poor can participated, which carry the advantages and the feasible measures to overcome constraints or risks are listed below:

Province	Proposed aquaculture livelihood	Advantageous group
Quảng Ninh	Development of oyster and molluse aquaculture	**Poor**
	Fresh – water aquaculture	**Poor**
Ninh Thuận:	Aquaculture of seaweed (especially cage seaweed)	**Poor**
Trà Vinh	Sea crab in mangrove forest	**Poor**
	Oyster and molluscs raising	
Hà Tĩnh	Fresh –water aquaculture	**Poor**
	Offshore aquaculture is not recommended.	**N/a**
Ninh Bình,	Offshore oyster farming (on alluvial warp)	**Not poor**
	Prawn farming or combination of fish-shrimp in brackish water in alluvial plain	**Not poor**
	Fish – rice	**Poor**

Other cases regarding provincial needs (inland) – the case of An Giang catfish cage fishing

The needs for inland aquaculture in inland provinces are also diversified. It varies regionally from the North to the South. There are aquaculture models for mountainous areas with small fish ponds like in Yen Bai, Cao Bang province[10] or the cage fishing model like in An Giang province.

[10] RIA1, pilot model for aquacultural household size development in mountainous area, small investment

Box – Investment needs for Raising Tra and Basa for poor fish farmers in An Giang[11]

Tra and *Basa* farming is a traditional livelihood in Mekong Delta and particularly in An Giang province. In An Giang province, there are now 3,400 catfish cages (2002) on the flowing river and a water surface of 1,430 ha for catfish ponds. The number of ponds in the province is not high due to a large amount of land owned by farmers. In An Giang, 80% of households are engaged in catfish farming, not less than 10,000 people in raising catfish by cage and about 20,000 farmers provide services for Tra and Basa farming cages, ranging from hired labor on cages and ponds to working in seafood processing). For the fish farmers in An Giang, the investment cost of rafts (cage) and some equipment is quite high (over VND 100 mil for 30 tons capacity cage). Usually the farmers have to mobilize from savings or borrow from bank. Other costs include costs of fingerlings, feeding, labor, and other costs. The farmers can also borrow from the processing and export company with sale contracts or at very high interest rates from the money lender (2%-3% per month). Investment in cages is much higher than that in ponds. Though there was good market for the Tra and Basa products and the companies operating in local areas give purchase orders for farmers directly, there were still some risks caused by fluctuating prices and the control of private traders. Although water flows or ventilation has not been a big problem due to the natural flows of Mekong River, the emerging issues for the catfish farmers may include the preventive and curative measures together with safety and hygienic standards for export quality level like ISO9001 or HACCP where the role of local authority may be crucial.

[11] ActionAid Vietnam, 2002. Extraction of "What do the catfish farmers say?". The consultation was conducted in two provinces – An Giang and Vinh Long.

Chapter 4: Role of market and other assistance to poor fishing community

4.1. Market and its influence over the possibility of diversification of income for poor

a) Market influence:

- In Quang Ninh (Hai Ha district), both input and output markets are opened for individuals without the local authority monitoring and management over quality or the government's role in supply of quality material and varieties. Thus, consumption channels and sustainable contracts for procurement with processing enterprises have yet not established. Due to uncontrolled input market, whereas the government's service system for material and varieties supply is ineffective and insufficient, the local people usually have to procure from individual agents with uncontrolled quality. It easily causes risks, resulting in loss. The origins of varieties for aquaculture are highly diversified. From 2002 on, the number of oyster-farming households rapidly increased and oyster varieties source have become limited. Thus, 80% of the households have shifted to keeping white oyster with varieties being procured from southern provinces and neighbouring provinces such as Nam Dinh and Thai Binh. Garrupa varieties (fish in salty and brackish water raised in sewer dike) are procured by local people. They use nets to catch those varieties. Prawn varieties is procured from China, the majority of those varieties are not subject to quarantine. The province has taken some counter-measures by construction of some varieties production farms, but supply cannot meet demand. A variety quality control station is located in Mong Cai (border area with China). The output market for aquatic products is also diversified, as the local market and Chinese market demand is relatively high and local supply is limited (due to low productivity), all the output products are procured by individuals on site. Especially, fresh water fish is not enough for local demand. As such, output markets do not seem to be a risk for aquaculture farmers here in the near future..
- In Ninh Thuan, the market factor does not cause significant impact on livelihood of community, especially for the poor fisherman. Some major livelihoods (mentioned above) are subject to market influence, such as seaweed keeping. Up till now, there is almost no problem regarding market share and price. However, regarding horn cattle farming livelihood (sheep, cow, goats), the market greats affect income. At present cattle farming is widely developed. Sheep, cow and

goat farming is considered to be an advantage of Ninh Phuoc. The price is unstable, and many households suffer loss due to change of varieties.

- In Ha Tinh, market (both input and output) has significant impact on diversification of people's income, especially the aquatic products aquaculture and processing. In Thach Ha district, the input market (varieties, food, epidemic disease medicines) and output market (high value aquatic products such as green grayfish, frog, and tortoise) are open and controlled by individuals. The local authority does not exercise any monitoring over input quality or provide any assistance in formation of product consumption channels. The consumption market is not yet developed as local people can not afford the product price while yield is not sufficient for sell-out but potential for aquatic products is quite huge. In addition, at present, the demand for African carp and aquatic products of high value for export is extremely high. There was a phenomenon of 'redundant for eating but insufficient to sell' for the local people because of a lack of markets for the aquaculture products. Nevertheless, the price of each product unit is heavily dependant on the price and fluctuation of input materials. As such, the market usually plays a decisive role in the efficiency of production in general and production of farmer and fisherman in particular.

- In Ninh Binh, factors such as market conditions and prices are often given high attention by farmers. Due to the ignorance of market tendencies and farmers just following the season, prices for aquaculture tend to fall very low and fluctuate. There is an informal market where small traders (located in the commune center) buy back products from farmers who set the price. The situation is the same for aquatic input prices such as seeds and aquatic food.

- In Tra vinh, the fishing community revealed that merchants/business men supplied the inputs and outputs are often unfavorable towards those who rely on agricultural production, especially the unstable price of farm produce and foodstuff, aquatic products means the producers, particularly the poor, make a loss. More so than price, the people are concerned about the quality of inputs. Hence, they would hope for a supportive system of agriculture, and aquaculture at commune or district level to ensure the quality of input price like variety, food, materials, fertilizer, technical services and insecticide. The fishing community also recognize the role of association/ collective group (perhaps among 3 and 4 fish farmer households; or enterprises to get to mutual benefit in bargaining the output price.

b) **Recommended solutions for market improvement for poor fishing communities:**

The poor fishing communities are facing market problems with deterioration of the market mechanism and the influence of informal market players. They have suggested several solutions as follows;

- A government logistics service system for fishery in the district and commune in should be established in order to ensure quality and maintain stable input prices for varieties, food, material, and medicine. However, it is still to encourage individual businesses to extend the service network to communes, hamlet to serve local people for price and quality competition.
- The selling mechanism should be flexible to be competitive with individuals (deferred procurement, loan).
- The local authority should reinforce their role of supervision, monitoring over quality and price of individual logistic services for fisheries.
- Information center in the hamlet on aquaculture knowledge, farming techniques and market behavior should be established.
- Farmers should have better links with processing enterprises for output purchasing and even for technology and technical assistance.

c) Financial related measures

One of the critical issues is credit for the poor. The poor fisherfolks have limited access to credit, both informal and formal channel, which hinders them in their livelihoods. Reasons varied from procedures and relevance of credit policies by the Bank. Though the Policy Bank has implemented some more flexible mechanisms for the poor (i.e. no collateral), in fact, few people can lend or rotate credit because the term and loan size is not really suitable to the fishing livelihoods. Recommendations related to credit policies are captured, as follows;

- The loan period should be about 2 years (not too short), thus, the local people do not have to sell immature fish. Also, the poor should benefit from favourable interest. Loan size could be about 25-35 million VND/household, (which is sufficient for 5 ha of fresh water fish farming).
- Credit can also be channeled via mass organizations. The experience from Quang Ninh or Ha Tinh (Women Union and OASIS) may be a good case of credit provision to household groups so that they can assist each other where community's supervision responsibility is enhanced.

Box 5: *Labour for aquaculture lagoon preparation – this seemingly easy solution turns out to be infeasible as the local people are still occupied with daily worries.*

Fresh water fish farming only needs initial investment, to cover pond, lagoon excavation, and preparation. Significant labour is needed for pond embankment for flood prevention. Pond excavation, and embankment cost is 5-7 million /sao (=350m2), the average area of each households is 5 sao, thus total required investment adds up to 25-35 million. Labour has to be hired, and labour circulation can not be exercised as all households are busy with daily life.

(opinion of men in village 5, Duong Hoa commune, Hai Ha district)

4.2 The Government and local authority's related policies:

In general, the Government has implemented some policies. Fishery Law was introduced in 2005. However, at the local level, the policies need to have schemes in order to be implemented properly. The poor need some policies to assist them to overcome many constraints (like lack of assistance for fishery encouragement: supply of technical-scientific knowledge of farming, epidemic diseases, aquatic products catching, unavailability of typical models, shortage of information on varieties market, food, output markets) A number of synchronous assistance mechanism and policies need to be developed, in order to minimize risk for people taking part in aquaculture.

In Quang Ninh for example, although the province and district authority has introduced proper policy to shift low-efficiency agricultural land to aquaculture, they have not issued attached supporting policies and mechanism, such as investment for infrastructure (construction of solid dike, sewer, channel, traffic roads and electricity), credit assistance, technical training (conduct more practice and increase the number of typical models), dispatching of more aquaculture staff to locality, construction of convenient logistic service system (varieties farm, varieties quality control center, material – food – diseases prevention and curing medicine supply service, products collection, processing units). Assistance from donor and other organizations is also limited. Only the SUMA project (through Ministry of Fishery) has assisted the district (Hai Ha district) in development of plan for salty and brackish water aquaculture in 2006-2010 period and provided some training courses on aquaculture skills (with emphasis on theory) through Women's Union and Province Agriculture Encouragement Center.

In other case like Ha Tinh, both districts reflected lack of assistance from the local authority on aquaculture though there was some external assistance from SUMA. The province and district's policy of shifting the low-efficiency agricultural land to aquaculture is quite sound and suitable with local people's wishes. However, despite encouragement policy and detailed mechanism,

policy has not been developed (lack of assistance for fishery encouragement: supply of technical-scientific knowledge on farming, epidemic diseases, aquatic products catching, unavailability of typical model, shortage of information on varieties market, food, output market). Both communes have not received loans from overseas organizations or from the fishery industry, apart from loans from Bank for Agriculture and Rural Development, Bank for Policy. Can Loc district has also not received any assistance from organizations for poor people in the aquaculture development process (catching, farming, processing):

The key recommendations from the poor fishing communities regarding support from government and local authorities include;

- To combine capital sources, focus on solid construction, synchronous upgrade of infrastructure of aquaculture development (dike, sewer, channel, road, electricity). Inter-commune irrigation system should be constructed. Once the active irrigation and drainage system is constructed, efficiency can be enhanced and risk in aquaculture is reduced.
- To establish varieties production centers and varieties control center for districts and hamlets.
- To provide more training on aquaculture, with emphasis on practice and establishment of pilot models.
- To dispatch aquaculture staff to local areas. To establish aquaculture encouragement staff network down to hamlet level (hamlet chairman or experienced person, selected by local people).
- To reinforce development of processing stations under combination model to take advantage of capital and skills from partners (like the medusa processing model in Cai Chien island).
- To develop aquaculture risk insurance policy
- In addition, it is necessary to set up hydrography and meteorology observation system to be aware of the climatic conditions in order to give timely warnings to coastal farmers, minimize risks for aquaculture households, especially farming areas in tide plain and coastal area.

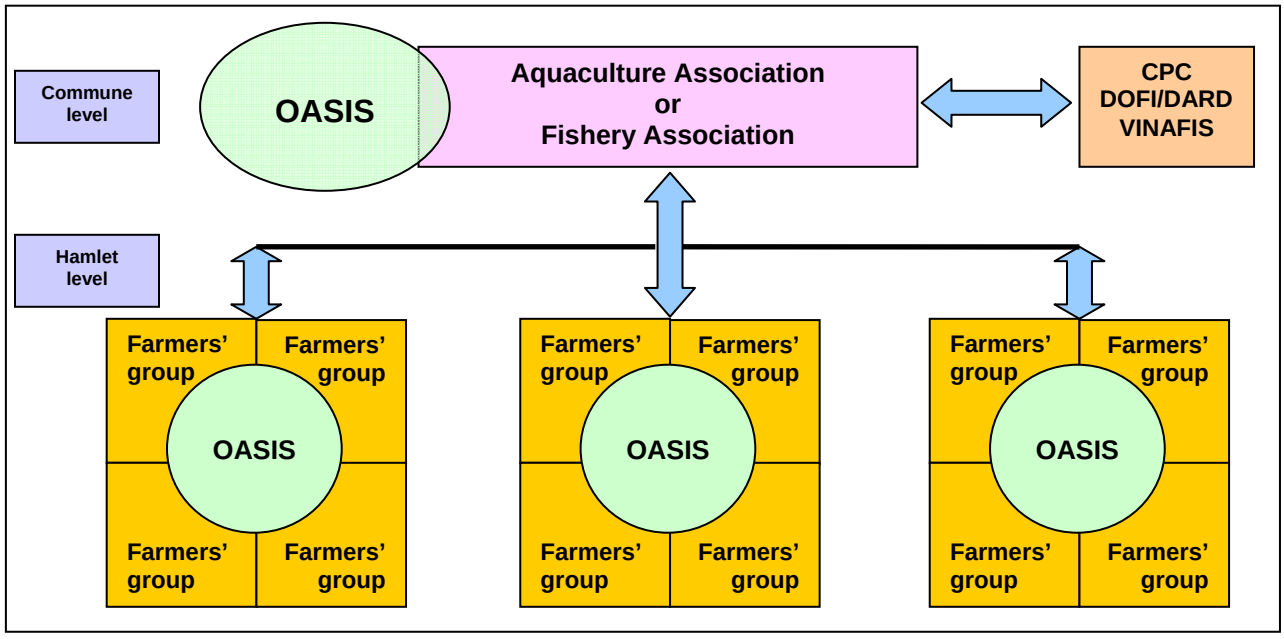
Chapter 5: Recommended Strategy to support poor fishing community

This chapter generally comes up from the research team, capturing the experience and current good practices in Vietnam and other countries, experience from assistance of international donors to address the issues identified through the consultation. The chapter also tries to link with key recommendations to work out an strategic approach that may help the poor fishing communities on their livelihood development, resource utilization and enhanced support institutions in the future.

1. Institutional development:

Although associations and farmer groups may vary in size, services and financial basis, some common features can be found (Fig. 1). The first step would be to cluster farmers' in self-management groups according to geographic location within the commune, species farmed, and/ or farming system. The second step would seek the way to establish a legal Fishery or Aquaculture Association (FA and AA) at commune level with its own charter and which would represent the several farmers' groups. Such FA & AA would then be registered with and work under the local district or provincial VINAFIS (nationwide association of fisherfolk and fish farmers with a new charter), and would facilitate the link with CPC, DOFI and/ or DARD.

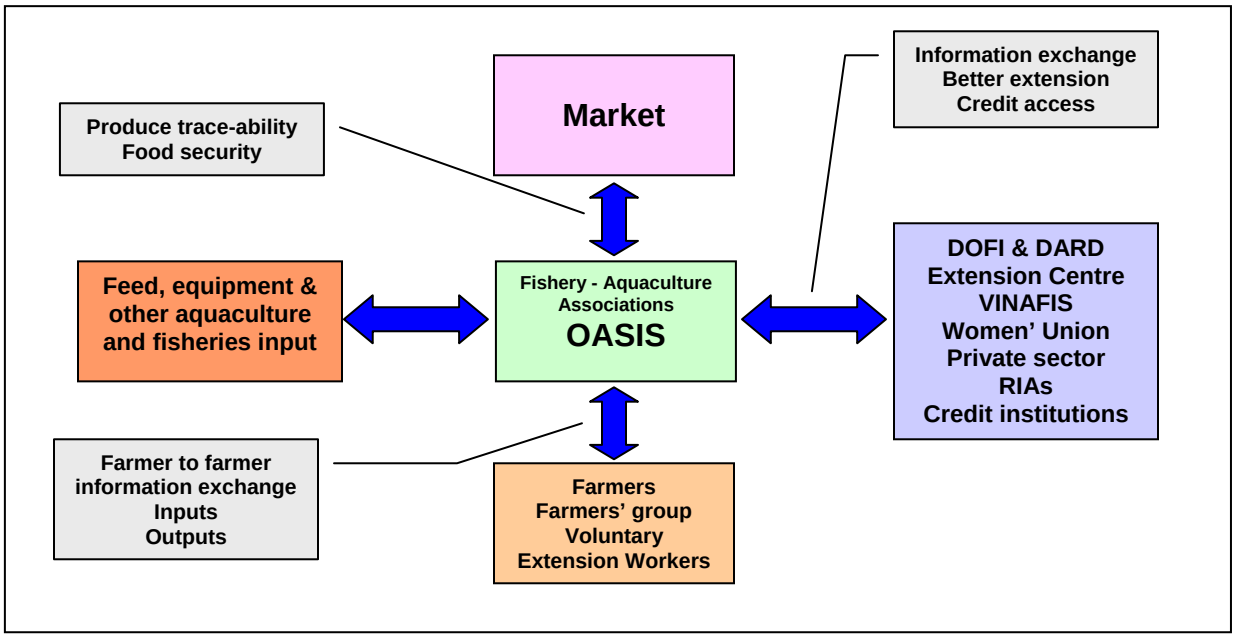
Fig.4. 1: General structure of Fishery and Aquaculture Association at Commune and Hamlet level.



Source: Davide Fezzardi.

Lessons learnt from SUMA project show that the organization of local user groups have several advantages, both economically and at household level but is also expected to pave the way for improved methods of implementing management forms with a higher inclusion of the user groups. The financial sustainability of such organizations would be assured by fostering the establishment of One-stop Aquaculture Supplies & Information Shops (OASIS) focal points at village level and/ or nested within the FA or AA (Fig. 1 and 2).

Fig. 2: Main functions and services of an OASIS.



Source: Davide Fezzardi.

OASIS can be defined as business oriented and self-financing small centers which get economic benefits from commission on input sales to farmers and/ or on marketing farmers' produce. Within a village they usually are located in small shops and are run by entrepreneurial farmers. They also provide the contact point whereby trained and non-trained farmers could gather together to exchange information while relaxing after a working day. OASIS could provide information as to where quality seed can be bought (contacts with hatcheries and traders), extension material from DOFI, DARD and the private sectors, and host training courses for farmers. Extensionists could organize weekly meetings where answers to specific problems raised by farmers would be provided. If equipped with computers and access to internet, OASIS could link to domestic and international markets and provide key information to farmers' group and FA & AA which could co-ordinate produce harvest and sell it directly to processing plants thus by-passing intermediaries and getting a fairer price.

Experience from India, Bangladesh and from Vietnam, show that OASIS are a sustainable source of information and inputs at the village level, are cost effective and sustainable as they are self financing. SUMA experience shows that the FA and AA formed in the 4 locations have been very varied in terms of service to their members (Box 2). Nevertheless the overall experience with FA & AA and OASIS has been positive and it is envisaged that in the future with improved links to VINAFIS, a product certification and disease early warning systems in place, these mechanisms will be increasingly more successful.

Box 4.1 : OASIS in Quang Ninh province

In Hai Lang commune, Tien Yen District, Quang Ninh province, SUMA has been instrumental to poverty reduction through aquaculture: in 2005 out of 947 households in the commune, 388 (41%) were involved in aquaculture compared with 186 (22.2%) in 2001. All 388 farmers were clustered in groups and four OASIS, one in each of Thanh Hai, Hai Thai, Doi May and Trang Tien villages were established following a participatory consultation. The four OASIS are located in small shops run by aquaculturist-cum-extension-volunteers and provide input services (feed, fertilizer and other aquaculture material) and free extension material and information to all farmer groups. Further to this, a general consensus in more than 100 farmers resulted in a Fishery Association (FA) set-up whereby farmers are willing to pay an annual membership fee and one of the OASIS owners, Ms. Hue has been democratically elected in the FA Board by the FA members. The FA is also adopting a participatory M&E system.

Source: Draft SUMA Completion report, 2005.

Aquaculture & Fisheries Associations: Main Constraints. At local level, one of main constraints is the general tendency to run the business individually resulting from the lack of perception of benefits if acting as a group. Farmers have limited education and access to information. They lack knowledge of future international market requirements such as food security and trace-ability. At provincial and district level, there are still few VINAFIS "branches or hubs" which do not have a well defined role and responsibilities. At central level, VINAFIS has still a blurred institutional set up lacking a clear leading and active role and strategy.

Key recommendation for establishing Aquaculture & Fisheries Associations with OASIS:

- Identify any existing farmers' Group and Associations in the pilot commune and build on their experience;

- Encourage small-scale farmers to get affiliated in self-management groups and Aquaculture and Fishery Associations;
- Foster the link between Groups and Associations with DARD, DOFI, WU, and credit institutions;
- Support Fishery and Aquaculture Associations to establish a Participatory Monitoring & Evaluation system (PM&E);
- Support and train Associations to improve skills and capacity to represent farmers, have access to information and deal with early disease warning system and management (including medical kits/boxes and water quality test kits);
- Identify and support mechanisms to assure financial sustainability to farmers' groups and Association as project exit strategy (e.g. OASIS);
- Provide each OASIS aquaculture related posters, leaflets, booklets, extension materials and different inputs from DOFI, DARD, development projects. These extension material will be on show as reference material with certain leaflets and guidelines for sale;

Key recommendation for establishing OASIS at village level:

- Identify in villages, people running small shops; possibly already doing aquaculture; who have interest in developing his/her knowledge in various aspects of aquaculture and shows interest and capacity to transfer such knowledge to other farmers; respected in the community;
- Provide appropriate training and basic equipment to those shop owners;
- Provide each OASIS with aquaculture related posters, leaflets, booklets, extension materials and different inputs from DOFI, DARD, development projects. These extension materials will be on show as reference material with certain leaflets and guidelines for sale;

2. Market development

Market access is considered a bottleneck for poverty reduction projects through aquaculture and there is a need for a vertical integration from producer to consumer through the whole value chain. At a local scale, the low level education of farmers and opportunity to access to information limit the opportunity to identify and explore new market outlets. Moreover, small-scale farmers usually run their business individually and therefore harvest their products without consulting other farmers, are usually linked to seasons and need to get cash income as soon as possible. Sometimes, the need to sell is also driven by a crop which shows signs of disease or because the bad season is

approaching increasing the risk of loosing the crop. Acting as a single farmer can never generate enough produce which would be needed to be sold at once to processing plant or international buyers. Investing in traveling far to develop market channels could be very expensive and require negotiation and other commercial skills. Thus, most farmers sell their produce to local middlemen or middlemen from other provinces that drive the price. Pressure on price occurs also for the second crop in areas where harvest time is close to flood and storm season and farmers are urged to sell the crop to avoid risk of losses.

At national and international level, MOFI foresees further competition from foreign rivals in both domestic and export markets after Vietnam joins the World Trade Organization (WTO). To increase the Vietnamese competitive capacity and retain and improve market penetration, the sector must continue to meet markets' quality standards and conform to regulations in other countries, including those related to tariffs, anti-dumping issues, and certification schemes. Currently Vietnam accounts for 170 processing plants which are already licensed to export to the very strictly regulated EU and an even larger number who are authorized to export to the US and Japan. Moreover, it is crucial to improve the domestic flow of raw seafood material from production areas with few processing plants to areas with high processing capacity via better infrastructure but also through a better producers' organization via Farmers' Associations. This would allow the sector to be more resilient for temporary lack of raw materials for processing in some areas which also cause the need for imports from abroad. Further, this would also help farmers getting a fairer price during seasonal production surges when the price usually drops.

Key recommendations for market:

- Identify alternative aquatic product outlets and help communities to build commercial links with those markets, taking them through each and every step of the process;
- Explore alternative and complementary livelihood options including aquaculture and capture fisheries post-harvest processing added value and link to national and international markets (e.g. dried sea cucumber to Hong Kong; dried seaweed to Malaysia and China);
- Encourage small-scale farmers to get affiliated in self-management groups and Aquaculture and Fishery Associations to get organized and harvest as a group to provide sufficient produce to potential buyers;

3. Extension services

The Fishery Extension Centers (FECs) in DOFI organize regular aquaculture trainings every year especially at the beginning of farming season. There are technicians who receive training and up-dating extension material to review and study every year. They may operate in different groups which cover one or more district each and organize training sessions at commune level according to the need. The methodology employed is usually traditional or on-site training and extension material might be handed over to farmers depending on available resources. According to site, FEC might be mainly involved with shrimp farming training reflecting the general CPCs priority for the industry in terms of economic growth and job creation. For inland communes DARD is involved in fisheries extension. The following needs might improve extension effectiveness:

- Need for ToT to improve the knowledge of FECs and DARDs extensionists;
- High quality extension material e.g. leaflets on BMPs and GAPs;
- New training methodology e.g. Aquaculture Farmers' Field School (AFFS)[12];
- More training equipment e.g. LCD projector.

Feed companies might also provide valuable extension training though not in a regular way. Universities, NGOs, and development projects might also be engaged in regular extension and training in aquaculture. All these extension iniatives including those from GoV, project driven and private sector, are usually not coordinated and may generate confusion to farmers especially if proposing different messages. Another issue is to which extent the trainings delivered are developed following a participatory Training Need Assessment (TNA). Moreover, the New Fisheries Extension Strategy which MOFI is planned to promulgate in 2006 and which aim at making the Decree 56 operational[13], acknowledges the key role of extension for the fishery sector economic development and poverty reduction:

> *"It is clear that there should be changes in Vietnam fisheries extension and that these changes should be based on the available resources. One of the challenges is to ensure the quality and efficiency of extension work. In the future, better off stakeholders in the fisheries sector may be able to pay for high quality extension services. But it is also necessary that effective extension services also reach large numbers of the poorest fish producers, free of charge"*

[12] AFFS derives from the agriculture sector and Integrated Pest Management (IPM) principles. Briefly, AFFS is a participatory training methodology where farmers work in group combining theory with practice in the field at pond site. The extension workers act as facilitator and create conditions for farmers to discuss and exchange their ideas (farmer to farmer aquaculture technology transfer). SUMA has piloted AFFS for shrimp farm in Ca Mau and Quang Ninh province from 2003-2005.

[13] Government of Vietnam, 2005. Decree No. 56/2005/ND-CP of April 26, 2005 on Agricultural Promotion and Fishery Promotion.

and calls for new ways to strengthen the relationships between partners and the links between State, NGOs and private enterprise, to improve the quality and reach of fisheries extension services to as many targets as possible. Therefore, the extension service would definitely benefit from a better co-ordination between stakeholders. Moreover, at local level the establishment of Farmers' and Self-Management Groups, Aquaculture and Fisheries Associations and OASIS would greatly contribute to improve the extension service (Fig. 1 and 2).

Key recommendations for extension:

- Identify aquaculture training needs and provide technical trainings to farmers. Beside technical subjects, trainings shall include: (a) record and book keeping; (b) basic aquaculture economics, and (c) business plan development to improve farmers' capacity to get a loan and to manage aquaculture business;
- Provide technical support through sufficient and capable local extension officials from DARDs and FECs in DOFIs via ToT;
- Need to develop public and private extension service synergy and improve co-ordination between agencies engaged in extension (GoV, private sector, NGOs, Universities, projects);
- Explore new extension methodology eg AFFS;
- Improve the extension system by supporting the establishment of Voluntary Extension Workers at commune and hamlet level;
- Support the adoption of aquaculture Better Management Practices (BMPs) and Good Aquaculture Practices (GAPs) according to NACA and regional trends;
- Encourage small-scale farmers to get affiliated in self-management groups and Aquaculture and Fishery Associations.

4. Credit provision and access

Micro-finance institutions (MFI) providers in Vietnam include the formal sector of banks and credit co-operatives, the semi-formal sector with involvement of mass organizations, and the informal sector of money lenders and other private lenders. According to the new micro-finance decree No. 28, micro-finance is defined as an activity providing simple banking services to low-income households and people, especially the poor. The following are the most commons MFIs:

Formal sector. Vietnam Bank for Agriculture and Rural Development (VBARD) is a state-owned commercial bank, with a nationwide network of branches in all 64 provinces and 563 districts of Vietnam, and with some inter-commune branches and transaction offices. VBARD is a financial institution with considerable experience in serving rural areas and handle credit activities. It operates on a nationwide approved system of rules and mechanisms which set the lending capacity to the district branches whilst the provincial headquarters retain the authority to approve loans which exceed the district loan disbursement upper threshold. The access to credit via VBARD appears difficult to poor because of (i) the district branches are far from remote areas thus difficult for the poorest to reach; (ii) although some improvements in the lending process for small loans it appears that VBARD does not have specific product targeting the poor.

Moreover, although official regulations do not call for collateral for small loans, in practice VBARD still requires loans guarantees from clients. The land use title deed (also known as "red book") is largely the most common assets which VBARD holds until the loan repayment is completed. The latter can explain why most poor people still face difficulties in accessing formal credit as they do not have any other assets to be used as collateral or do not dare to borrow money taking the risk of loosing the red book.

The Vietnam Bank for Social Policies (VBSP) is a non-profit financial institution established to provide loans to poor households (according to MOLISA standards) at subsidised rates and thus supporting the poverty reduction program in Vietnam. As for VBARD, VBSP has its own network in provinces and districts and headquarters in Hanoi. Since 2002 VBSP uses the WUs to funnel credit at grassroots level by means of savings and credit groups. VBSP provides max VND 7 million per loan repayable in 2-3 years at 0.50-0.65% monthly without requiring collateral. To be eligible for a load VBSP requires a recommendation from the credit groups and endorsement by WU and CPC. Business plans are not required but an evaluation is done by WU and later on by VBSP. The heavily subsidised loans raise doubts about their long term sustainability and there are also concerns about the efficacy to target the real poor.

Semi-formal sector: The Women's Union (WU) is a political mass organization with nationwide coverage at all administrative levels which promotes the role of women and their participation in social activities, and plays a key role in micro-credit outreach. Although the WU are not yet considered an MFI according to Decree 28 (GoV, 2004) they have been allowed to operate as such by the GoV and the SBV. WU is currently acting as the implementing agency for micro-finance activities for a large number of donors, international NGOs and for VBSP. For the latter, WU

disburses loans based on a group budget until funds end and members start to repay the loan, which is crucial for the other members' ability to get a loan. Working in partnership with the WU is quite cost effective as their staff is salaried by Gov., get some training and provision of some equipment (computer and software) and a modest commission for the implementation of micro-finance activities.

The WU operates credit and savings activities which can be categorized in two types:

- Organizing group and acting as a loan guarantor for its members borrowing from VBSP funds;
- As main manager (most of the time owning in perpetuity as well) of fund from members' savings, loans and grants from INGOs and other Donors.

WU establishes groups at village level where a leader is usually elected and a socio-economic development plan prepared[14]. Within the groups women promote credit and saving schemes, and revolving funds and operate a peer pressure on members to return money on time and the whole household is liable. The general criteria for borrowing money through the WU are: (a) be poor, (b) to be affiliated to WU, (c) capacity to work (not old or disabled people), (d) capacity and willingness to saving, although each case is considered individually. When people receive a recommendation from their credit group they generally receive the loan. WU collects the interest and repayment on monthly basis and organizes a monthly meeting. The repayment rate is high at about 95% and in some cases the debt can be written off, for instance when a mother dies and leaves behind her children. WUs are usually not involved with the VBARD credit scheme.

Informal sector: These include revolving funds and saving schemes (community-based), middlemen, neighbours and relatives who are related to the borrowers. They play a key role for those poor households who cannot have access to the formal and/ or semi-formal credit. As the loan procedure is usually much simpler than the formal and semi-formal one and it is based on trust rather than on assets, most farmers prefer to use the unofficial credit system.

Interest rate policy: In 2002 the State Bank of Vietnam (SBV) has decided that credit institutions (except VBSP) can determine their own interest rate whilst VBSP continues with subsidized lending.

[14] Including the main activity which each group will embrace usually pig and/ or other livestock raising.

Credit possibilities do exist in Vietnam and tailor-made savings & credit schemes could be envisaged in aquaculture development projects. However, if there are no sound investments to be made, in this case and in a broader sense for farmers doing aquaculture without a proper technical knowledge, or the farmers are already heavily indebted, it is unlikely that the provision of credit will be an effective means of increasing the household income. There are too many examples in Vietnam where farmers without proper knowledge turned overnight to shrimp culture and failed, accumulating debts of millions of VND. Moreover, generally farmers do not have the capacity to develop a sound business plan to submit for a loan request, and they pay little attention to or cannot have savings.

Key recommendations for credit:

- Carry out a credit need assessment within the pilot commune in connection with the identified aquaculture system promoted and target beneficiaries;
- Identify and set-up savings & credit scheme and revolving funds via Women's Union and/ or local credit organizations to meet the investment needs for each kind of aquaculture model proposed;
- Provide training to WU to increase their financial management capacity;
- Identify aquaculture training needs and provide technical trainings to farmers. Beside technical subjects, trainings shall include: (a) record and book keeping; (b) basic aquaculture economics, and (c) business plan development to improve farmers' capacity to get a loan and to manage aquaculture business.

4. ICZM & Aquaculture

Integrated Coastal Zone Management (ICZM) has been widely proposed as a more comprehensive approach to coastal management which addresses the limitations and difficulties associated with sectoral and enhanced sectoral approaches, particularly in relation to coastal aquaculture (Barg, 1992, Scialabba, 1998, GESAMP, 2001). The followings are some reasons (GESAMP, 2001):

- coastal aquaculture commonly straddles the boundary between land and sea;
- resource (land, water, and their products) ownership or rights allocation, and related administration, is often complex or ambiguous in prime aquaculture locations;

- aquaculture may be seriously affected by water quality and habitat degradation caused by other activities;
- aquaculture itself may affect environmental quality and the interests of other users through conversion of natural habitat, through pollution of recipient waters with nutrients, organic substances, and potentially toxic (hazardous) chemicals, and through the spread of disease;
- poorly sited or planned aquaculture may result in negative feed-back and self pollution.

However, although ICZM is getting more and more popular as general framework it is generally recognized that its implementation is very challenging usually due to institutional and political barriers to the key requirement for vertical and horizontal integration, especially in developing countries. GESAMP (2001) identified the followings as main constraints to ICZM: (i) there may be significant political barriers to full participation, (ii) the resource use issues are usually complex, (iii) control or ownership of land and water in the coastal and especially inter-tidal areas (commonly used for aquaculture) could be also an issue, (iv) the scope of comprehensive ICZM can make it a long and complex exercise, (v) dealing with this complexity, and defining the level of detail or accuracy required for any resource appraisal or participatory process is challenging, (vi) detailed and comprehensive plans with specific development prescriptions may be undermined by the sheer power of financial and political/economic interests and this may be a particular problem with those types of aquaculture, such as shrimp farming, which are the most profitable.

Many of the issues associated with the adoption of an ICZM approach might be mitigated by developing initiatives at local level first which would reduce complexity and make stakeholders participation more manageable and effective although this may appear to undermine the principle of vertical integration. It is envisaged though that the bottom-up approach would exert pressure from below to achieve change and/or integration at higher administrative levels. Therefore aquaculture development and its potentials and associated issues may serve as a stimulus and starting point for developing of an ICZM process (GESAMP, 2001).

ICZM is expanding rapidly in Vietnam associated to an evolving institutional structure under the Ministry of Natural Resources and Environment (MONRE) and Donors funded projects such as the "Vietnam–Netherlands Integrated Coastal Zone Management (VNICZM) phase I (phase II currently in pipeline)" and the "Livelihood Improvement in Central Coastal Provinces, Viet Nam" (MOFI-World Bank, 2004; ADB, 2005).

Given that ICZM implies multi-sectoral planning and regulation, and therefore some form of co-ordinating body or authority to assess and balance the various sectoral interests, it has been suggested that an ICZM Committee need to be established in Vietnam at the provincial level with representation of all involved provincial departments and representatives from other key stakeholders groups (MOFI-World Bank, 2004).

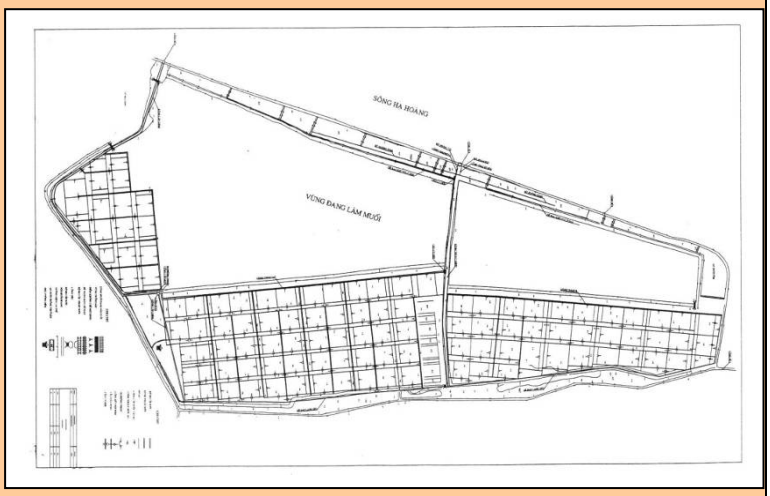
Key recommendations for ICZM and Aquaculture Development

- Begin with more focused local coastal management initiatives, or enhanced sectoral initiatives;
- Work with local authorities at provincial, district and commune level to identify, develop and support aquaculture development;
- Liaise with other Gov. agencies at every level to develop integrated cross-sectoral planning including aquaculture;
- Promote co-management & community-based management regimes via identified initiatives and ensure both local government and communities are well trained;
- Support for small-scale producers and groups to cluster in Aquaculture & Fisheries Associations would facilitate the establishment of co-management regimes at different scale;
- Strengthen the collaboration with other sectors;
- Support the link to national ICZM initiatives e.g. ADB and the Vietnam–Netherlands VNICZM projects.

It is clear that all these aspects should be taken into consideration when planning pilot interventions. The following example in Thach Ban commune (Box 4.2) reports a recent Donor driven full-scale intervention for poverty reduction through aquaculture targeting poor households without access to water resources and without access to land.

Box 4.2 Poverty reduction through aquaculture development: case study in Thach Ban commune, Thach Ha district, Ha Tinh province (SUMA – Support to Brackish Water and Marine Aquaculture).

The objective of the intervention was to develop community based brackish water and marine aquaculture in a sustainable way to improve farmers' income and contribute to poverty and hunger alleviation.



42 ha (80%) of a total of 75.6 ha of converted salt land to aquaculture has been included in a safe aquaculture planning process, completed and approved by provincial and district authorities in August 2003. Major infrastructures have been built with Donor funds including supply and drainage canals, bridges, and settlement ponds involving hundreds of local laborers for most of their construction in 2004 and 2005. These facilities will serve the adjacent salt field as well which will continue to be productive and guarantee an income to farmers. With such infrastructure in place, 33.6 ha (of which 28.6 ha water area) already planned could be easily developed further and allocated to other Households (HHs).

After a lengthy and participatory process 105 ponds of 3,300 m^2 each with associated land title deed have been allocated by DPC to 105 poor and close to poor HHs which represent 12.5% of 841 HHs in 8 villages (see table below). A range of 7.2% to 17.5% HHs in each village has received a pond, including average and better-off family to boost aquaculture in the area. The productive water area covers 31.7 ha out of 42 ha being transformed in ponds.

SUMA has created a strong awareness about the potential for aquaculture to reduce poverty. In 2000 only 10 HHs in Thach Ban were involved with aquaculture under the Program 773, a Gov. initiative supported in several poor communes. Since then thirty five training courses were given in 9 subjects (including techniques in stocking, pond building, infrastructure, disease control, house economic analysis, credit management, tiger shrimp and clam culture) to 150 farmers of which 50

were women (30%). Several study tour have been organized to visit nearby districts and provinces where successful aquaculture operations are in place.

An Aquaculture Association has been established to replace the PMU and a potential OASIS focal point has been identified. Aquaculture extension material has been distributed to farmers since 2001. In 2005 the link with DOFI Extension Centre has been strengthened and two extensionists were assigned to visit Thach Ban on regular basis to assist farmers.

A MoU has been signed with the district Women Union in Thach Ha (WUTH) to run a micro-credit and savings scheme and to encourage diversified pro-poor aquaculture in Thach Ban. Training on micro-credit management was delivered to the WUTH who has organized the selected 105 HHs into 10 credit & savings groups.

From 2001 to 2005 several pro-poor aquaculture species & models have been tested by farmers in 4 trial ponds including tiger shrimp, mud crab, grouper, tilapia and innovative aeration systems. Hard clam culture has also been supported in the mud flat along the estuary. The 105 pond systems will adopt an 'improved extensive' shrimp production intercropped with species like brackish water acclimated tilapia to reduce the risk of failure due to disease outbreak. Moreover, the national dyke has been remarkably improved with major intervention to the sluice gates for a better water flow management to the whole productive area.

	income/ person/ month (000VnD)				
village	0-100	100-150	150-200	>200	tot
1	5	4	1	0	10
2	10	3	1	1	15
3	5	4	1	1	11
4	7	3	0	0	10
5	4	2	1	2	9
6	6	4	1	1	12
7	13	4	1	0	18
8	17	2	1	0	20
tot	67	26	7	5	105
%	63.8	24.8	6.7	4.8	100.0

Benefit Cost calculation. This system cost Donors VND 6.5 billion to build (USD 411,000) of which 47% of this cost was paid to local villagers for their labour on the earthwork construction. This employment assisted with the poverty reduction in the commune over a 2-year period. Costs included: (i) feasibility study; (ii) design; (iii) development; (iv) implementation; (v) operation; (vi) maintenance, which is considered over the 10-year period to be a labour cost to repair embankments etc. as the running costs are discounted in the net profit rates below.

The system life cycle is considered to be 10 years. This is not because it will deteriorate beyond use by that time but due to the probability that by 2015 an intensified system will be put in its place.

The system currently comprises 105 x 3,300m2 ponds with a total usable water surface area of 31.7 hectares. There is an additional 3.5 ha of water settlement area on the outlet side where seaweeds and bivalve molluscs can be seeded to absorb some of the nutrients from the system. Total culture area is 35 hectares. The productivity is assumed to be an average of 800 Kg/ha shrimp for one crop in the 31.7 ha area as an improved extensive system with tilapia as a second crop with 500 Kg/ha production levels.

The value of shrimp @ around 20mt/yr for the system is USD 64,000 net. The value of Tilapia @ around 15mt/yr for the system is USD 9,000 net. Seaweed/tilapia from the sedimentation systems would amount to an additional USD 1,000/yr. Total annual production USD 74,000 x 10 years = USD 740,000

10 year Benefit / Cost = 740,000 / 411,000 = 180%.

Source: Draft SUMA Completion report, 2005.

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APPENDIX 1: Map / Resource map of selected area

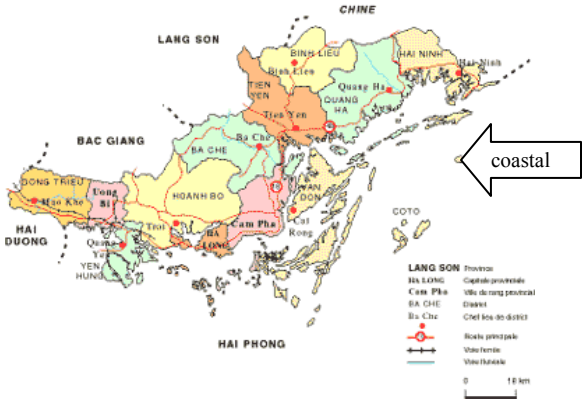
APPENDIX 2: Basic statistics on aquaculture development in Vietnam

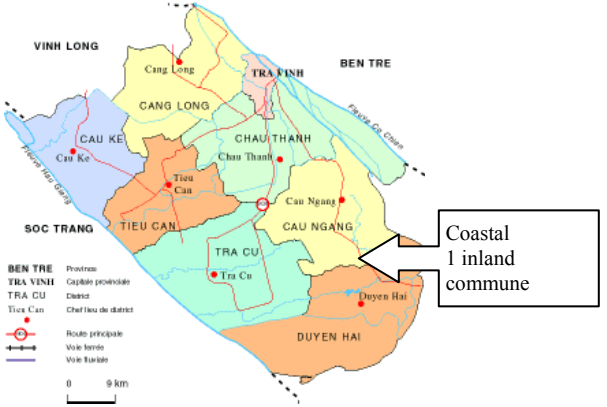
APPENDIX 3: List of study team

APPENDIX 4: Research and consultation methodology

APPENDIX 5: Summary report from provinces including list of consulted local people

Appendix 1 – Map of areas in consultation





Appendix 2: Fisheries Statistics

Table 1: **Achievements in fishery sector development in Vietnam, 2001-2005**

No	TARGETS	unit	2005	Compared to 2004 (%)	Compared to 2000 (%)	Total 5 years 2001-2005	Growth rates (%)	
							5 years	Annual
I	***Gross output***	1,000 tons	3,432.8	109.24	152.53	14,516.6	40.99	8.97
1	Total catch	"	1,995.4	102.86	120.13	9,318.9	15.69	3.71
1.1	Marine catch	"	1,809.7	104.40	127.47	8,247.4	22.18	5.14
1.2	Inland catch	"	185.7	89.88	76.95	1,071.5	-22.oo	-6.56
2	Aquaculture production	"	1,437.4	119.53	243.79	5,197.7	102.48	19.29
II	**Fishery export turnover**	1,000 USD	2,650,000.o	110.38	180.27	11,067,782.o	49.09	10.50
III	**Capital construction**	Billion VND	6,820.o	102.56	167.24	30,689.o	36.05	8.00
	Investment from budget	"	716.o	101.13	124.15	3,234.o	11.70	2.80
IV	***Area of aquaculture***	1,000 hectares	959.9	104.33	157.64		27.11	6.18
V	**Fishing vessel number**							
	Engine-powered vessels	Vessel	90,880.o	106.22	23.oo		15.89	3.76
	Total engine capacity	HP	5,317,447.o	112.58	64.oo		47.29	10.17
VI	***Processing facilities***	Plant	439.o	108.40			77.02	15.35

Source: 2005 Annual Review Report – Ministry of Fisheries

Table 2: Total volume of fish catching and aquaculture in Vietnam by province/municipality

No	Locality/Unit	Total catched volume (ton)		Total cultured volume (ton)	Export value (1000USD)
		Marine catch	Inland catch		
	Total	**1,809.689**	**185,722**	**1,437.355**	**2,650.000**
A	**Central state owned**	**127**	**0**	**0**	**128724**
	Vietnam Fisheries Corp.	0	0	0	112000
	Eastern Sea Seafood Corp.	127	0		3388
	Halong Seafood Corp.	0	0		9500
	Military				3836
B	**Local**	**1809562**	**185722**	**1437355**	**2521276**
I	**Red River Delta**	**88,238**	**20,288**	**215319**	
1	Ha Noi		610	9871	
2	Hai Phong	33,671	2.811	37483	20000
3	Vinh Phuc		1,359	8382	
4	Ha Tay		2,216	19702	
5	Bac Ninh		1,118	15390	
6	Hai Duong		2,356	28072	
7	Hung Yen		1,300	11000	
8	Ha Nam		668	11498	
9	Nam Dinh	28,170	1,830	30100	31880
10	Thai Binh	25,622	4,022	32509	300
11	Ninh Binh	775	1,928	11312	
II	**North Eastern**	**35,471**	**7,614**	**45007**	
12	Ha Giang		9	1080	
13	Cao Bang		59	246	
14	Lao Cai		10	1070	
15	Bac Can		20	406	
16	Lang Son		175	831	
17	Tuyen Quang		137	1760	
18	Yen Bai		775	2849	
19	Thai Nguyen		126	3551	
20	Phu Tho		2,935	10415	

21	Bac Giang		2,922	6005	
22	Quang Ninh	35,471	446	16794	28600
III	**North Western**		**1413**	**5900**	
23	Lai Chau		112	619	
24	Dien Bien City		55	686	
25	Son La		717	2442	
26	Hoa Binh		529	2153	
IV	**Northern Central**	**166,957**	**11,842**	**61115**	
27	Thanh Hoa	52,300	1,770	18263	24380
28	Nghe An	40,505	2,909	20842	15000
29	Ha Tinh	18,600	1,735	8271	20000
30	Quang Binh	24,761	1,339	4630	2500
31	Quang Tri	13,281	848	3007	3000
32	Thua Thien Hue	17,510	3,241	6102	5855
V	**Coastal Central**	**379,708**	**4,592**	**25871**	
33	Da Nang City	40,200	115	1088	48500
34	Quang Nam	45,813	1,759	5019	25000
35	Quang Ngai	87,020	366	3813	2900
36	Binh Dinh	105,473	2,007	3011	16500
37	Phu Yen	35,200	286	3098	7000
38	Khanh Hoa	66,002	59	9842	230000
VI	**Central Highland**		**3,679**	**10506**	
39	Kon Tum		352	655	
40	Gia Lai		248	185	
41	Dak Lak		1,403	5101	
42	Dak Nong		1,205	989	
43	Lam Dong		471	3576	
VII	**South Eastern**	**411,173**	**7,688**	**90253**	
44	Hochiminh City	21,602	147	32208	204200
45	Ninh Thuan	44,800		11190	5100
46	Binh Phuoc		310	4036	
47	Tay Ninh		2,893	3914	
48	Binh Duong		469	2789	
49	Dong Nai		3,175	24752	

50	Binh Thuan		694	4383	52000
51	Ba Ria – Vung Tau	197,282		6981	147000
VIII	**Mekong River Delta**	**856,621**	**728,015**	**983384**	
52	Long An	5000	4511	19919	18200
53	Dong Thap		19303	111155	56000
54	An giang		52062	172265	121000
55	Tien Giang	71082	3364	61095	45428
56	Vinh Long		8163	28595	8000
57	Ben Tre	72645	3301	61569	53000
58	Kien Giang	303565	6430	49778	85000
59	Can Tho City		6454	82179	162500
60	Hau Giang		4242	21870	128890
61	Tra Vinh	48946	15496	72522	34400
62	Soc Trang	26000	4800	71708	310000
63	Bac Lieu	61554	480	110466	109143
64	Ca Mau	139223		120263	500000

Source: 2005 Annual Review Report – Ministry of Fisheries

Appendix 3: **Research team**

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Method	Objectives
1. Literature review	To collect information and analyze the economic and social situation and trends: labor, local economic status, poverty reduction strategy, zoning reports, projects that relate to the poor fisheries and marine resources
2. Open discussion/ guided questions	To collect information from (province, district, commune) on income and labor, difficulties, constraints and needs as well as suggested solutions. Focus to be made on support programs to the poor fisheries and to preserve the marine and aqua resources.
3. Focus group discussion	To collect information from grass root fisheries communities (household, village leaders) on income and labor, difficulties, constraints and needs as well as suggested solutions and models which are relevant and demanded by the poor fisheries.
4. Priority ranking	Identify and rank the importance and constraints as well as emerging needs of the poor
5. Problem tree	To analyze the difficulties, constraints regarding the sustainable marine resource management and livelihoods.
6. Solution – objective tree	To identify the role and policies that would support the poor fisheries to ensure the job, stable income to achieve the objective of preservation of marine resources and protection of environment.
7. Household economic livelihood modeling analysis	To analyze the economic activities of household in consultation (main income sources, labor status, capital, land, expenses and icnome, constraints, suggested solutions on livelihood options and models that may be sustainable)
8. Photo –site visit to the fisheries and aquaculture models	To evaluate the effectiveness, capture the lessons learnt from models on aquacultural development that are suitable to the coastal areas.

Sustainable livelihoods and coastal economies for poor fishing communities

Date: 10 May 2006

Place: Hoa Binh Hotel, Hanoi, Vietnam

The purpose of the workshop was to enable discussion of coastal management for fisheries livelihoods, to discuss the findings and recommendations of the draft report "Engaging poor fishing communities in sustainable livelihood management in Vietnam" supported by JFPR fund and the World Bank. The consultation was jointly conducted by Center for Development and Integration (CDI) and a team from National Institute of Economics (VIE) led by Dr. Nguyen Van Huan. The draft report has been presented to over 50 participants from ministries, local administrative levels and representatives of 5 provinces who participated in consultation for comments and discussion.

Vietnam has an extensive coastline with diverse marine resources. Fishery is considered as economic potential livelihood, for contribution to the State Revenue and economic growth and improvement of the people's lives. Development of aquaculture and catching are choices for many localities for poverty reduction. In addition, despites its achievements and advantages, fisheries

development also faces many challenges, including environment pollution, ecological imbalance. The workshop is organized for all stakeholders, government officials, beneficiaries, environmentalist, researchers and communities to discuss the issues and to comment on "Engagement of poor fishing communities in the identification of resource management and investment needs".

73 participants from ministries, such as MOFI, Research Institute of Fisheries, Ministry of Agriculture and Rural Development, Prime Minister's Research Committee, University of Agriculture, Institute of Agricultural Economics, Donors and projects in fishery sector especially from the 8 provinces representatives and the research team.

The workshop was co-chaired by Mr. Pham Quang Yen – Deputy Director of International Cooperation Department – MOFI and Mr. Ron Zweig, the World Bank's Fishery Specialist, Task Manager. The panelists are Dr. Nguyen Van Huan – VEI – Head of research team and Dr. Prof. Vo Dai Luoc, General Director, VAPEC, member of Prime Minister's Research Committee

Mr Pham Trong Yen presented briefly the Vietnam fishery developments. Fishery plays a very important role in the economy with a volume of 3.5 million tons in 2005 and exports of USD 2.73 million, accounting for over 4% of GDP. The growth of the sector also confronts many challenges in terms of sustainability with exhausted costal resources, unstable offshore fishing, low capacity of resource assessment and allocation. Rapid, unplanned and unprompted aquaculture development by farmers has lead to negative impacts on the environment, and diseases among species raised. Therefore, support for the poor's livelihoods need attention from government agencies, international and local organizations, and authorities at all levels. The workshop is an opportunity for releasing all findings from research, surveys, discussions and comments to enable better understanding of all stakeholders on of the urgent sectoral issue of harmonizing fishery development with environmental protection.

Mr. Ronald Zweig - WB representative and Task Manager delivered sharing speech "An overview of Vietnam's fishery development". The main issues of the country's fishery development: coastal management, fish catching and aquaculture, and market penetration were presented in the speech. He also referred to the issue of poverty and specifically the poor living standards of coastal fisher folks despite diverse and abundant resources. Based on the current conditions, specific policies and

regulations, support is urgently needed for the poor in order to reduce poverty whilst at the same time preserving the environment.

Dr. Bui Quang Te – Representative of Aquaculture Research Institute, shared experiences in coastal fishery and aquaculture. He highlighted the important role and great contribution of the sector to the economy. The sector potential, situation and effectiveness of Vietnam coastal aquaculture development were presented. Aquaculture is a kind of farming of very high economic effectiveness: 2 -3 times higher than rice cultivation with profit rates of 33%. The activity also creates employment, narrowing the income gap between urban and rural areas, and improves local security situation. However, due to excessively rapid and unplanned development, and use of inadequate techniques it has had negative impacts on the environment. Most environmental degradation levels in localities are much higher than the accepted levels, mangrove deforestation for shrimp raising leads to serious ecological imbalance, and also underground water resources are exhausted due to abuse of shrimp catching. Some policy solutions (providing planned cultivation area, encouraging community participation and awareness, setting up technical management systems, timing, settling all raised problems), and the promotion of good models based on feasibility, effectiveness and environmental protection are to be implemented in order to minimize negative impacts, and achieve sustainable development.

Representative from CRES provided information about the mangrove ecosystem, regarding status of mangrove conservation in Vietnam and its implications on fisheries development. Mangroves play an important role in the life of fish, and provide firewood, charcoal, and medicine for the communities. Mangroves are also an important habitat for a great diversity of reptiles, mammals, and aquatic species. The trees can be seen as the “giant kidney” of the planet, the “green wall” protecting costal areas. The mangrove, however, has been rapidly destroyed for shrimp ponds, degrading wetland ecosystem and causing the loss of the “mangrove shield” which protects sea dykes and coastal estuary areas, with an area of just 155,290 ha in 1999. The situation requires the cooperation of the Ministry of Agriculture and Rural Development, the Ministry of Natural Resources and Environment and the Ministry of Fisheries in planting and rehabilitation of protective mangroves, planting wave-buffering mangrove belts along river banks and the coast planned fishery development. Reforestation of mangrove can benefit residents significantly as developed faunal resource, source of biodiversity, and as a destination for research and ecological tourism. The mangrove preservation and reforestation should be the focus of management agencies and the whole community.

Dr. Nguyen Van Huan – Head of the research team – summarizes the findings and community feedback from the poor fishery communities in 5 participating provinces. The report shows the characteristics of the coastal and coastal line areas for diversification of livelihoods as well as the possibility of access to resources, associated advantages and risks, government support, participation of private sector and international support. The recommendations were made based on the poor fisherfolks priorities for investment and livelihood development. The report shows the poor's constrained access to coastal resources, and little capital for investment. The poor's livelihoods such as diving for shrimp collection, and catching shellfish, lead to exhausted resources. Various costal communities' livelihoods include sandy soil agriculture, livestock raising, fishery cultivation and catching but are associated with high risks such as natural disasters (floods), water source pollution and epidemics. Data and information obtained from the study are the basis for concluding recommendations and requirements such as incentive credit for the poor, technical and breed support, output procurement, irrigation improvement, creating favorable conditions for the poor's sustainable livelihoods. There are also a number of recommendations from the research team, such as the establishment of grassroots aquaculture associations, promotion of fishing site forecasts, publication of offshore fishing guidelines, popularization of effective production models and especially improvements in community awareness of environment protection.

Dr. Mai Thanh Cuc – member of the research team – shared fishery development experiences from Ninh Phuoc district, Ninh Thuan province. Communities are sustained through various livelihoods such as cattle raising and fish sauce processing but the most popular is fish-breeding (50% of labourers are in the sector). However, the poor's lack of capital directs them to costal fishing mainly. Aquaculture focuses on shrimp, fish cage farming, shrimp breeds, sweet snail raising, and especially algae (rong sun). it is usual that aquaculture faces many disasters and risks of water pollution and epidemics but the advantages of the model of seaweed alga cage cultivation outweigh the disadvantages because it can minimize failures with avoidance of loss, of being broken by waves, of being eaten by fish, and can be easily shifted to another location. The model is in rank 4, in terms of income generation, but is the first choice for many community members, and is the sustainable livelihood of poor farmers when classified by combination of all criteria. The folks, however, are in need of support in production as they receive few projects and programs. Improved management capacity of staff, community awareness of sustainable development, and dissemination of the alga cage farming model are needed in order to further support communities.

The representatives from the provinces commented on the report. The key points of their comments are as follows;

All provinces represented agreed that the report reflected the true situation and trends for fisheries development and local livelihoods and agreed with the recommendations (on seed, capital, technical support, training, market and infrastructure).

Regarding the resources; the participants agree with the focus on:

- Marine resources have been over exploited in many places, there is a lack of preservation and restoration.
- Fisherfolks lack capital to buy a fishing vessel for off-shore catching
- Fisherfolks lack knowledge and know how for catching and raising of aquaculture

Regarding raising of aquaculture:

- In almost all provinces/areas, there is potential for aquaculture. Large areas of salt water and brackish water (Ninh binh with 7000 ha, 10000 ha of land that only grow one seasonal rice)
- But fisheries are seen to be the livelihood for the high income / rich and middle income people.
- People lack capital and investment in infrastructure for fisheries activities
- High risks remain: epidemics, lack of techniques
- Economic integration is fast but local government has no capacity to cope up with price fluctuation, product quality and market volatility
- Local government provided support but with limited resources.

The challenges for fisheries development to use the potential resources effectively would be:

- People lack knowledge of fisheries livelihoods and face high risks
- The environment allows generating good productivity in the first few years but risks come often in the later years with epidemics.
- Water is polluted due to lack of infrastructure (eg. water irrigation channels)
- Community awareness is low in appropriate water usage
- Poor quality of seeds
- Weak management in collective business or household business to promote healthy private sector development (ship purchasing, cooperative operation)
- Over exploitation because of the low community awareness on sustainable environment and resources management (eg. explosive catching)

Recommendations:

- The expertise of a research institute in the fishery sector in providing technical support or seeds would be highly demanded
- There is a strong need for extension services strengthening
- The poor and localities need external support (capital, investment)

How the poor participate to generate livelihoods

The fisherfolks need to participate to bring about their own choice on livelihoods and also participate in resource management. If the investment is only for economic growth purposes, the rich may benefit more, and the poor may still have difficulties in accessing resources.

The provinces also gave the models that they found effective in fishery livelihoods in the context and situation. The specific feedback from the provinces is as follows:

Representative of Hai Ha district - Quang Ninh province

Hai Ha is 160 km far from Ha Noi, on the Chinese border, with favorable conditions for catching and aquaculture development. Mollusc raising (in eight costal communes) has been focused on for development in the "Hai Ha Aquaculture Development Plan to 2010" with district government's support for product consumption. However, farmers experienced failures due to their lack of technical knowledge, recurrence of diseases, as well as limited investment. Thus, the poor have no other livelihood options except for exploitation of costal resources. At present, mangrove planting is one way of environmental protection in the province. Local people can reach incomes over 220,000 VND per capita per month from resource collection and not be considered poor (under new poverty line) but the resources cannot exist for long time without protection. Local authorities are concerned with the poor's livelihoods and try to support them but limited capital resources have been a constraint. Therefore, the locality needs support from all organizations for pro-poor aquaculture development. The research team's comments on supports for investment, breeding, technology, and market penetration for farmers are also agreed upon.

Representative of Ninh Binh province

Ninh Binh comprises large water surface area of 17,000 ha, including 7,000 ha costal brackish water, and 10,000 ha uncultivated area with just one rice crop annually.

High economic value of aquatic products has lead to mass investment in aquaculture. But difficulties in knowledge and cultivation techniques among farmers have resulted in risks and failures as well as negative environmental impacts. Moreover, poor infrastructure especially irrigation system (water supply and drain by the same system) is also a reason for failure. At the moment, the issue of shrimp breeding is urgent in aquaculture development since it plays a decisive role in output quality. There has not been any program or research on the issue in the province yet. Furthermore, ineffective implementation of offshore fishing and aquaculture projects and failure in operating new and modern equipment due to fisherman's low capacity also obstruct poverty alleviation. Poverty has caused costal resources to be exhausted. The Ministry of Fishery and Research Institutes should play a more active role on the issues of breeding and techniques, in order to achieve efficient and sustainable fishery.

Representative of Thach Ha – Ha Tinh

Thach Ha district consists of 37 communes, including 9 communes specialized in fishing with 800 small capacity boats, an annual production of 4,500 tons, and rising output of 3,500 tons. Some years ago, investments were made in some large and modern fleets for offshore fishing but then they have been sold for bank repayment due to failure of operation. The policy of seasonal fishing and two main models of intensive and semi-intensive aquaculture have been developed. However, farming density has been reduced due to prevalence of diseases. Now, despite completion of the fishery development plan, the district lacks capital for implementing it. Rapid development of aquaculture is a disadvantage as farmers with inadequate awareness, low access to techniques, no upgraded estuary dykes, and lack aquaculture extension staff creates many difficulties and negative effects. Farmers, with awareness of shrimp's high economic returns, focused on shrimp raising but then did not receive profits due to low prices and failure to access market. It is necessary to support farmers in technical training, environmental awareness improvement as well as planed aquaculture production, toward sustainable development.

Representative of Ninh Thuan province

Facing the situation of over-exploitation of coral by unemployment and the poor, the model of "Community participation in costal coral range management" was established and developed with wide dissemination among farmers, fisherman, and school groups. With awareness of the two issues that livelihoods should be identified with the Poor's participation in order to be effective and the poor have limited access to aquaculture models which require much investment, the province made great effort to support the poor in their livelihoods. Research and surveys show feasibility of the model of alga farming in costal areas as it is pro-poor, associated with environmental improvements, and possible to duplicate. Communities play a very active role in obtaining suitable and sustainable livelihoods for themselves.

Representative of Tra Vinh province

Cau Ngang district (of Tra Vinh province) is very poor, with low community management, and low awareness levels. People, having little land and capital for production, do costal exploitation by the extermination method, leading to exhausted resources. Some models for sustainable income generation and poverty reduction have been applied, such as integrated mangrove planting and aquaculture extension, integrated rice and secondary crops cultivation (in sandy soil), and oyster raising. The models will be implemented efficiently with aquaculture training courses, strengthened technical staff, extension system, provision of quality breeds, improved infrastructure (land survey devices, irrigation system, etc). It is also necessary to create mirrors and cases for duplicating among the poor.

Dr. Vo Đai Luoc – VAPEC was the peer review for the workshop, he commented that: Situation and trend, reasons for poverty and difficulties as well as potential and weaknesses of studied coastal areas are well highlighted in all reports. Fishery development, based on local situations, needs planning, a feasibility survey, and to be harmonized with the whole costal area. The coastal resources that have advantages of geographical position also should be taken in consideration. Vietnam's geographical location is highly desirable for other countries. Moreover, aquaculture in all localities, up to now, is only on a household scale but not larger. Thus, the farm model or company model may be a good. Fishery development requires comprehensive measures with participation and cooperation of all stakeholders.

Comment by Mr. Ron Zweig – WB representative in Viet Nam

The world fishery is in crisis and so is the Vietnam's fishery. Aquaculture development has had negative impacts on the environment, causing serious environmental degradation. Effective aquaculture models of integrated rice and aquaculture farming, fish cage and oyster raising should be duplicated. The sector's development is to be well planned and participated in by all stakeholders.

Dr. Pham Trong Yen, Deputy Director of International Cooperation Department, MOFI

Much attention is paid to balanced fishery development and natural resources and environment protection. Aquaculture encouragement in localities faces many challenges that need support by many organizations, especially in dealing with provision of sustainable livelihoods for the poor.

Over the past few years, the fishery sector has developed very fast. The Government of Vietnam takes the fishery sector to be one of the prominent growth sectors for the economy. In 2005, the productivity of the sector achieved 3.4 million tons of which catching was 2 million tons and raising was 1.4 million tons. The total export revenue reached 2.73 billion USD. In the last year, fishery sector contributed 4% of GDP. It is estimated for 3.5 – 4 billion USD, the productivity achieve 4 million tons of which catching would be 2 million tons and raising 2 million tons. In the period of 2006 – 2010, the catching productivity will remain at 2 million tons a year while the breeding will increase from 1.4 million tons to 2 million tons a year by 2010

Together with the high growth rate, the sector also faces challenges of sustainable development. One of the big challenges is the maintaining natural resources; the near shore resources have been over exploited. The reservation and size of the fish decreased. The productivity of the high value fish also decreased, and ran out in some areas. many fisherfolks have left the near – shore catching and moved to smaller hole nets, which facilitate faster exploitation of near shore marine resources. The aquamarine area in the North (Northern Bay), and in the West (Thai Lan bay) have been also over exploited. The off-shore fishing has become unstable because of big initial investment, high price of inputs (petrol eg) the post – harvest technology is still at low quality, the reservation survey and allocation of marine resources and the possibility of sustainable exploitation have not been reviewed.

With this situation, the fisherfolks move more to aquaculture raising. Many coastal line areas have been converted to aquaculture raising instead of agricultural crops especially the Government's Resolution09/2000- NQ-CP dated 15 June 2000 on economic restructure. However, the conversion of

land use for aquaculture raising has happened very fast, and lacked a master plan from the central to local levels, which lead to negative impact on the environment, and livelihoods losses. That has also created losses and risks to the fisherfolks.

Meanwhile, almost 20 million of the population in 115 coastal districts and towns are living on aquaculture related breeding and fish catching. Almost all fisheries communities are poor, and education levels in fishing communities are low so the livelihood support to the poor is very important. The livelihood support would depend on the commitment of localities and Government, International organizations and it also depends a great deal on perception, awareness and understanding of fishing communities.

APPENDIX 6: Provincial Reports

1. **Quang Ninh province**
2. **Ninh Binh province**
3. **Ha Tinh province**
    - **Can Loc district**
    - **Thach Ha district**
4. **Ninh Thuan province**
5. **Tra Vinh province**

VIETNAM

ENGAGEMENT OF POOR FISHING COMMUNITIES IN THE IDENTIFICATION OF RESOURCE MANAGEMENT AND INVESTMENT NEEDS

QUANG NINH PROVINCE

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Boxes, Tables and Figures

1. Overview of socio-economic and environmental development and potential for exploiting coastal fishery resources and aqua-culture in the surveyed province, districts and communes

1.1. Quang Ninh province

Quang Ninh province is located within big coastal corridor of the North. Together with Hai Phong, Quang Ninh plays an important role for the whole country to open up to the sea in the North. In the future when the strategy for "two corridors, one belt" is put into operation it is also important for provinces in the South West of China and the North of Laos. With Mong Cai international border checkpoint, increasingly improved roads and convenient seaport system, Quang Ninh has become an important link in goods transport and transactions between Vietnam and other countries in the region and the world. In addition, Quang Ninh can lie within goods transport and transaction channel among provinces in the East and West of China.

Quang Ninh's administrative structure comprises one city, three provincial towns and 10 districts with 130 communes and 54 precincts/district towns. Its population in 2005 is about 1,081,363 persons, including 51% population living in rural areas[15].

Tourism resource is dominant advantage of Quang Ninh with Ha Long Bay and a system of islands, numerous beautiful beaches and natural landscapes recognized by UNESCO as the world natural world heritage. Quang Ninh has abundant mineral resources, especially coal and construction materials. Sea and marine resources are important factors in Quang Ninh's strategy for sustainable development. .

The province's economic structure during the period 2000-2005 is relatively stable, of which industry, construction and service account for a large share in the province's GDP while share of agriculture, forestry and fishery is very small. share of each economic sector in Quang Ninh's GDP is 50.9%, 7.8% and 41.3% respectively[16].

During 2001-2005, Quang Ninh's fishery had recorded strong development in areas of exploitation, aqua-culture, processing for export and fishery logistics, achieving the highest growth rate in agriculture, forestry and fishery and creating regular employment for over 30,000 employees, improving income for people. Some results are presented in table 1:

[15] Quang Ninh Yearbook 2005
[16] Quang Ninh Yearbook 2005

Table 1: Some achievements of Quang Ninh's fishery in 2001-2005

No	Indicators	Unit	2001	2002	2003	2004	2005 (estimated)
1	Total fishery output	Tone	31,839	43,745	45,771	55,925	52,712
1.1	Fishing output	Tone	23,432	26,699	30,575	35,258	35,918
1.2	Aqua-culture output	Tone	8,407	17,046	15,196	20,667	16,794
2	Import-export value	Million USD	33.00	42.50	42.60	36.90	45.00
3	Employees	Person	27,258	29,300	31,700	34,800	36,000

Source: Quang Ninh Yearbook 2005; Report on 5 year socio-economic development plan (2006-2010), Quang Ninh Department of Fishery, December 2004

With regard to **aqua-culture,** Quang Ninh Department of Fishery coordinates with authorities at district and provincial level, providing guidance for fishery development in forms of marine, brackish and fresh-water aqua-culture, promoting investing in sustainable fishery development. It also focuses on guiding the development of some concentrated aqua-culture zones, shrimp raising projects, fish raising in cage in the sea and pearl-oyster raising at large scale, establishment of shrimp breeding stations and sea fish breeding stations (with some achievements recorded in sea fish breeding), promoting research of new breeds, emphasizing technology transfer and replication of new high yield fishery breeds. The province's aqua-culture has recently gained considerable progress.

Table 2: Main changes in aqua-culture in Quang Ninh

	Before 2000-2001	After 2001
Aquatic species	Shrimp and some fresh-water fish for export and domestic consumption	Species that are of high economic value and for export such as sugpo prawn, white-leg prawn, garrupa, red snapper, white butterfish, unisexual African carp, oyster, pearl-oyster… Since 2003, some other specialties like lobster, mytilus

		smaragdinus,… have been raised.
Raising mode	Mainly extensive raising	Improved intensive raising. A proportion of cultivated areas has been transferred to intensive and semi-intensive raising.
Cropping	One crop sugpo prawn	2 crop South American white-leg pawn. In some areas, three crops can be practiced. Combination of one crop for sugpo prawn and one crop for fish…

Aqua-culture area has been rapidly increased, from 14,657ha (2001) to 16.700ha (2003); fish raising in cages: from 1,360 cages (2001) to 5,300 cages (2004). In addition, there are nearly 500ha of water surface enclosed and dozens of ha of fences erected on traits for fish raising in the sea. With regards to structure transformation, realizing the Resolution 09/2000/NQ-CP on structure transformation, in three years (2002-2004), the province had transformed 500 ha of low yield agricultural land to aqua-culture area, gradually creating freshwater fish raising zone for export and domestic consumption, contributing to poverty reduction for farmers and fishermen[17]. As of the end of 2004, the province had 11 shrimp breeding stations. Some of them had been invested but have not yet met the requirements. Breeding technology transfer had met with difficulties and volume of investment mobilized was low[18].

With regard to **fishery resource exploitation**, off-shore fishing meets with numerous difficulties such as increased prices of input materials and oil, low capacity of the majority of ships with limited off-shore operation, mismatching management qualifications and fishing techniques, fishery logistics fail to meet the requirements. Many off-shore fishing ships operate with low efficiency, resulting in low principal and interest service to the state. As of the end of 2004, 20/58 fishing ships stopped operation due to capital shortage and lack of management capacity by ship owners. Fishing techniques are mainly based on experience and coastal fishing.

With regard to the province's **master plan and plans for fishery development,** in 2001 Department of Fishery formulated master plan for fishery development for the period 2001-2010, which was approved by Provincial People's Committee. Then the Provincial People's Committee provided guidance for districts to formulate master plans for fishery development.

[17] Report on 5 year socio-economic development plan (2006-2010), Quang Ninh Department of Fishery, December 2004

[18] Report on 5 year socio-economic development plan (2006-2010), Quang Ninh Department of Fishery, December 2004

The Provincial People's Committee also approved the Project on strengthening and developing fishery resources in Quang Ninh for 2003-2010 and the Project on developing fishery logistics services and seafood processing establishments in Quang Ninh during 2003-2010. At the same time, the Project on sustainable fishery development and Policy on encouraging aqua-culture in the province were formulated. Investment in constructing infrastructure for 10 concentrated aqua-culture zones has been made; master plans for raising fish in cages in the sea and for raising mollusk, pearl oyster. Quang Ninh Provincial People's Committee coordinated with localities to formulate the Project on transferring low yield paddy growing areas to aqua-culture.

Assessment of aqua-culture of the province over the past years indicates that achievements are not proportional to its potential, advantages and requirements.

Box 1: Outstanding issues in development of Quang Ninh's fishery[19]

- Aqua-culture: Although 10 concentrated aqua-culture zones have been established, they have not yet been developed positively into concentrated material zones for export processing. The raising modes and techniques are mainly intensive and improved intensive raising. Intensive and semi-intensive raising is still conducted in a small area, and therefore output and yield are still low. Techniques for raising high yield shrimps still depend on a team of engineers that are still in short in the province. New breeds are mainly produced in some shrimp breeding stations, fails to meet the demands. At present, the province is in badly shortage of sea fish and mollusk breeds.

- Fishery exploitation: Vocational orientation in fishery exploitation meets with many difficulties. Research and technical innovation in fishery exploitation have still been slow and conducted in scattered manner. Vocational structure transformation is slow with a small number of trained labor forces. Fish men mainly base on experience, leading to low output and productivity. Aqua-product value in fishery exploitation is not high and percentage of materials for export processing is low. There are some inconsistencies in guidance and management of fishery exploitation, off-shore ship building according to Decree 393/Ttg. At present, imbalance in development of coastal fishing force and fishery resources, environment and ecology is of great concern.

- Fishery processing for export: Investment has not been made in processing new products; new markets are still in a small number; domestic products are poor; domestic consumption markets have not yet been expended; trade promotion programmes have not yet given

[19] Report on 5 year socio-economic development plan (2006-2010), Quang Ninh Department of Fishery, December 2004

attention to and their potential has not yet been made used of; export value over the past years increased rapidly but unstably.

- Fishery logistics service: It has not yet been invested proportionally to fishery industry's potential. It is still of small scale and in patchy manner, fays to meet the province's fishery industry development. Investment in terminals for ships and boats to anchor has not yet been given appropriate attention as stipulated.

- State management: of breed quarantine, disease and epidemic prevention, feeds, registration and register fishing ships still met with various difficulties.

1.2. Hai Ha District

1.2.1. Natural conditions

Geological location: Hai Ha is a mountainous, border and island district, 150 km away from Ha Long city to the North and 40 km away from Mong Cai international border checkpoint. It borders China to the North with the border line of 22.8km in length, the East sea to the South with the coastline of about 35km, the West to Binh Lieu and Dam Ha and the East to Mong Cai provincial town.

Hai Ha district has a relatively convenient transport network. The district center is located on the highway 18A linking to Mong Cai international border checkpoint and Ha Long city. With the coastline of 35 km in length and many river estuaries, Hai Ha has great advantages in trade and transaction by waterway with our country's coastal provinces and other countries. Hai Ha has Bac Phong border checkpoint with China and Cai Chien islands with healthy environment and beautiful landscape. It has high annual fishery output and potential for the development of fishery industry, tourism, service for tourists and transit import – export to Quangxi and Yunnan provinces in China.

With regard to **climate,** Hai Ha is a coastal mountainous district, and therefore its climate is mixture of mountain climate with cold winter and hoarfrost that cause harmful effects on people's life and production and coastal tropical climate with summer season having, storms and low pressure that cause negative impacts on fishery production. Especially in Cai Chien islands, it has dry and drought winter resulting in great negative impacts on agriculture production, particularly on Spring – Winter crop.

System of rivers and streams in Hai Ha district is relatively dense. Rivers are normally small and sloppy with wide upstream and narrow downstream. River estuaries are under the impacts by tides. Hai Ha coastal district has 5 river estuaries. Only Ha Coi river has a large reservoir (upstream) with a very big flow in rainy and stormy season, while the remaining

rivers are small with negligible flows. Due to the funnel shape of the estuaries, the district's estuaries are affected by salty tidal water most of the year. However, due to the region's high and sloppy topography, rivers' estuaries are greatly affected by flood in rainy and stormy season. Low flow of river in dry season and salt intrusion occurred regularly lead to difficulties for agricultural development and shortage of freshwater supplied to aqua-culture zones in dry season.

Land resource: Hai Ha natural land covers an area of 49,565.16ha, including only 4.781ha of agriculture land (accounting for 10% the total), 22,068.5ha of forest land (accounting for 44.6%), 241ha of unused plain land and 12,939.7ha of hilly and mountainous land, 6,332.6ha of unused tidal flats, 1,677.87ha of rivers and streams and 7.4ha other types of land.[20] This indicates that area of unused land in the district is still large and can be efficiently exploited for socio-economic development and poverty reduction. However, soil in use in the district is very poor, not appropriate for crop development. Major areas that are suitable for shrimp culture are enclosed with relatively solid dike system, thus having fewer impacts by sea waves. The dike outer tidal flats are mainly sand mud or mud, very appropriate for raising mollusk like oysters…

Wetland is a natural resource, playing an important role for sea ecology. Wetland resource of Hai Ha district is very abundant and diverse, including coastal wetland, inner wetland and artificial wetland. Almost all aqua-culture activities are developed on wetland areas. The district's sustainable fishery development is to establish a model for rationally using and preserving the wetland and its ecology. .

In conclusion, in terms of natural conditions, Hai Ha district has the following main advantages and disadvantages for sustainable development:

- **Advantages**

- Large area of water surface and tidal flat enclosed by a system of islands, convenient for salt-water aqua-culture.
- Abundant and diverse fishery resources with numerous high economic value species that are now mainly raised in tidal flats, brackish ponds and cages in the sea like oyster, seashell, arca, perch, red snapper… These are among natural potential breeds for aqua-culture.
- Climate and hydography in Hai Ha are relatively favorable for development of brackish aqua-culture.

[20] Master plan for brackish aqua-culture in Hai Ha district for the period 2006-2010, December 2005.

- Soil in tidal flat is especially suitable for raising mollusk like oyster, arca, and seashell.
- Hai Ha's natural environment has not been polluted by industrial, service, agricultural and domestic wastes. This is a very favourable condition for aqua-culture development.
- Its geographical location that is situated on the Ha Long – Mong Cai economic axis with Phong Sinh border checkpoint – only 40 km away from Mong Cai border checkpoint is favourable for export seafood to China.

- **Disadvantages**

- In winter, the district is affected by northeast monsoon which leads to sudden low temperature, affecting growth rate of raised species. Great variation in temperature, air, rainfall and tidal regime from March to May have direct impacts on aqua-culture, especially on mollusk raising.
- High rainfall in rainy season (accounting for over 75% of total yearly rainfall). This, combined with strongly divided topography, the slope of rivers and streams, leads to the fact that in rainy season, very rapid and strong freshwater inflows destroy aqua-culture ponds or cause sudden overflow of fresh water in coastal water, resulting in shocks and death of raised species, especially in coastal mollusk raising zones.
- Despite relatively favourable hydrography, Hai Ha's sea is shallow (3-5m in depth), only suitable for applying simple cage raising techniques rather than advanced techniques like Norway iron cage that requires at least the depth of 20 meters.

- **Calamities:**

- Storms and floods: are regularly occurred, causing most serious impacts on coastal aqua-culture. Annually, there are 5-6 storms occurs in Hai Ha sea area. Strong stormy winds result in rapid flood on the district's short and sloppy rivers, leading to big river water outflows to the coastal area. If this is combined with rising tidal, consequence will be very serious. It will result in destruction of pond banks, bridges and culverts, leading to loss of breeds and high costs for repairing and maintaining and massive death of raised species due to be shocked by inflows of great volume of fresh water. As a result, attentions should be given to techniques to ensure river banks' sustainability in rainy and stormy season. In addition, seasonal factors should be taken into account in such a way that harvest can be carried out before rainy and stormy season to minimize losses. Due to sloppy topography and the river estuaries that are greatly affected by flood water in the rainy and stormy season, attention

should be given to variation of salty degree in the water of the river estuaries when developing aqua-culture in the interval of rainy and dry season.

- Coastal line erosion and land slide: The coastline of Hai Ha District situates on the funnel shaped river estuaries with Tien Yen – Ha Coi hollow where collapse in tectonics is in progress and sediment is in shortage, leading to erosion of coastline. Land erosion in coastline is not so big; it still causes gradual loss of tidal flat area...

1.2.2. Social, economic and environmental features

Administrative units: Hai Ha district has 16 administrative units at grassroots level. It has one town and 15 communes, including 9 coastal communes which have great potential for cultivating brackish and salt-water aqua-culture.

Population, labor force and living standards: The district's total population is 50,267 persons, including 25,352 females. Total number of households in Hai Ha district is 11,108. There are 8 ethnic groups living in the district, namely Kinh, Dao, Tay, San Diu, San Chi, Nung, Muong and Hoa; 77% of total population is Kinh while Dao accounts for 17.2%. Percentage of urban population and rural population in total population is 13.7 and 86.3 respectively. Average population density of the district is 102 persons per square km, compared with 179 persons per square km of the whole province. It means that Hai Ha is thinly populated. However, population is not equally allocated among communes[1]. Labor force of the district is 23,593 people, accounting for 47% of the total population, including 12,244 females. If only coastal communes and islands are taken into account, there are 5,129 households with labor force amounting to 11,834 people, of which 5,715 are females. In 2004, 20,288 persons engaged in agriculture, forestry and fishery, including 2,560 people involved in producing aquatic products; of which 1,711 people engaged in fishing, 617 in aqua-culture and 232 in fishery services[1]. The district has more 800 new entrants to labor force every year, but its industrial and service sectors have not been developed well, so only 40% demand for jobs can be met. This is a great challenge for the district on its development. Average GDP per capita of the district is VND 4.72 million per year, accounting for 78.4% of the whole province. Incidence of poor households in 2004 was 7.81%, decreased by 1.22% in comparison with that of 2003 (old criteria). In 2004, there were 171 households getting out of poverty, while 58 households falling back to poverty or becoming poor. In 2005, number of households getting out of poverty and falling back to poverty is 119 and 23 respectively. By 30/10/2005, among 747 poor households, there were 360 ethnic minorities ones.

Infrastructure: In terms of irrigation, due to its favorable conditions of river system, Hai Ha district has a relative good system of irrigation. In the whole district, there are 20 focal works with 322.5 km of irrigation canals, including 36 km of the main canals, 66km of the first grade, 107.5 km of second grade and 123 km of third grade canals. The district has some head irrigation works, such as the Chuc Bai Son dam and some small dams Quang Thanh, Quang Duc and Quang Son communes. Sea-dyke system is 32 km long with 53 culvert gates.

Up to now, some irrigation works have been degraded resulting in low utilization efficiency and limited irrigated areas. Thus, in recent years, the district has invested in consolidating 12km of dykes among the existing 8 dyke routes, 2 dams and 19km of canals (including 4.8 km of main canals, 7 km of 1st grade canals and 7.2 km of inner field canals). With regard to transport, Hai Ha district has 27 km of national highway No 18A and 18.3km of provincial road No 340. Inter-commune road axis is 117 km long and inter-village road is 572 km in length. In some places, there are only earth paths of low quality. Waterway network is of small-size but relatively dense. In the whole district, there are 8 ports for anchorage, 1 fish port in Cua Tieu of Cai Chien island. With regard of electricity, by the end of 2004, in the district, there are 15 out of 16 communes/towns have accessed to electricity. 72.8% households have accessed to electricity and 100% of towns and communes access to telephone and television.

Culture, education, health care and social issues: At present, in 11 communes, there are 16 culture houses and another 11 culture house are under construction. In the whole district, there are 30 schools, including 29 primary and lower secondary schools with 458 classes, and 1 higher secondary school with 29 classes. Besides, there are 61 kindergartens. The district has 1 regional hospital with 45 beds and 19 clinics belonging to communes/precincts and agencies and enterprises with 58 beds.

Economic development: In 2004, agriculture (including cultivation, animal husbandry, forestry and aqua-culture) accounts for 45.96% total value of all productive sectors. The figure in industry, small and handicraft industry and capital construction was 24.72%; and that of trade and services was 29.32%. In agriculture, aqua-culture contributed 40.1%, much lower than real aqua-culture potential of the district[1]. With regard to fishery exploitation, total number of fishing ships was 724, most of which are of small size and only for onshore fishing. In the whole district, there are 18 kinds of different fishing professions, mainly coastal ones. With regards to aqua-culture, in 2004, there were 1,675 ha devoted to aqua-culture, including 113 ha for fresh water aqua-culture, 383 ha for shrimp raising (mainly improved extensive raising), 871 ha for mollusk raising, 33 ha for sea-worm and sea-leech, 275 ha for brackish and salt-water fish. Aqua-culture output in 2004 was 3,322 tones, increasing by 40.7% in comparison with that in 2003. There were 617 workers in aqua-culture sector with average cultivated surface area of 2ha/person. By the end of 2004, the district has had 2 co-operatives and 5 enterprises operating in aqua-culture. In terms of fishery logistics services, the district has 8 ship terminals, mostly allocated at Ha Coi estuary and fish grounds in Tien Toi, Phu Hai and Quang Ha towns. Fishery logistics services are mainly under the forms of fishing equipment provision and ship repair. Almost all breeds and feeds for aqua-culture are imported from other districts or provinces[1]. The district aqua-culture performance in 2005 indicates that, in the same area, benefits brought about by fresh water fish raising is 4 times higher than paddy growing; inner dyke extensive brackish and salt-water fish raising has brought about returns to households but the amount is not high;

industrial scale shrimp raising requires big investments but unstable returns; oyster raising brings about good result but it is difficult to find good sources of breeds and capital, resulting in waste of cultivated area; sea-worm and sea-leech raising is only at simple level so the productivity is low, though it has not caused loss; many households are raising fish in small cages on sea, but due to their lack of knowledge, capital and stable sources of breeds, the returns is not so high; due to difficulties in finding sources of breeds, mystius smaragdinus raising has not been extended widely in the district[1].

Environment: Because industries have not well developed, there is nearly no industrial waste in Hai Ha district. Most of the district's area is mountains and hills so the area for agriculture is very little and exhausted, thus agriculture has not yet well developed. Fertilizer and chemicals are not widely used. In mountainous regions, teas are widely planted, and the amount of pesticide residues on tea trees may have impacts on environment of coastal areas. Besides, other resources of impacts on the quality of coastal environment mainly are daily garbage, lubricant from machines of coastal fishing ships and chemicals from fishing activities. At the moment, amount of all above wastes is not much, but it is very dangerous in the future. In order to develop aqua-culture, Hai Ha district needs to control all sources of wastes.

In summary, in terms of social, economic and environmental conditions, Hai Ha district has both advantages as well as disadvantages in developing sustainable aqua-culture.

*** Advantages**

- In recent years, aqua-culture in Hai Ha district has been considered as one of sectors that created economic breakthroughs, so it has been given great attention by the district's leaders.
- Labor force of the district is abundant and traditionally hardworking. People here expect to shift from low quality traditional agriculture, which is not suitable to soil conditions of the region, to aqua-culture in order to improve the living standards, increase income and reduce poverty.
- Most of coastal communes have ship terminals. The system of inter-communes roads is relatively developed. These are favourable conditions for a convenient exchange of goods.
- Irrigation system is quite good and it is important resource of fresh water for aqua-culture in the district.
- Demand for seafood products is high (from both domestic markets and contiguous Chinese provinces), especially demand for fresh water products (demand from only the district itself exceeds supply). Products are purchased at ports so it is very convenient for sellers and buyers.

- Hai Ha district was assisted by SUMA project, Ministry of Fisheries in formulating the Master plan for brackish and salt-water aqua-culture of Hai Ha district in the period of 2006-2010 in December, 2005. This is an important and firm scientific foundation for developing sustainable aqua-culture of the district in the next 5 years.
- In many years, the district authorities have continuously established transitional and pilot aqua-culture models, formulated projects such as Project on sea oyster raising for export (June, 2001), Project on industrial scale shrimp raising in Quang Minh pond (August, 2001), Project on fish raising in cages in the sea (October, 2002), Project on sugpo prawn raising in high tidal flats for export (October, 2002), Project on South American super lean frog raising (February, 2006), Project on mollusk breed hatching for meeting the raising demand in Hai Ha district by the year 2010 (February, 2006), Project on medusa processing for export (March, 2006).
- Hai Ha district has cooperated with Phong Thanh district of China that provides much of breeds for aqua-culture and also consumes great amount of seafood produced, though it is still only spontaneous cooperation. The district has also established some cooperation models with China with technical and financial assistance from China (8 medusa semi- processing establishments in Cai Chien Island).

*** Disadvantages**

- Most communes in the district are poor, leading to capital shortage for aqua-culture. Capacity for bringing into full play internal strength by the people is limited. Borrowing from Policy Banks is very difficult for aqua-culture because of its high risks.
- Aqua-culture in the district is operated spontaneously. Farmers do not have enough skills and experience while working in this sector is risky.
- Infrastructure for aqua-culture, such as dams, canals, drains, roads, electricity, etc existed but degraded, incompatible and insufficient. Especially, irrigation system for aqua-culture is not separated with system for agriculture. Most canals are earth built causing water leak and high risks of diseases. Some regions are lack of fresh water (relying on rainy water and subject to 3 months of dry and drought every year). As a result, it is very hard for the district to transform its structure and develop aqua-culture.
- Coastal fishing is spontaneous, mainly exploiting natural resources, without paying attention to reasonable exploitation and preservation of coastal fishery resources. Regulations on timing and seasons that fishing is not allowed have not yet been established. Fishing equipment is so primitive, only for coastal fishing, thus coastal resources are facing threat of being exhausted in the near future.

- Logistics services for aqua-culture have not met requirements. In the district as a whole, there is no establishment that produces and tests breeds. There is also no establishment for processing frozen seafood, partly because it is much easier to sell fresh products and output is so low that supply can not meet market demand. As a result, the importance of frozen seafood establishments has not yet been aware of. At present, products are kept mainly by frozen water. Provision of feeds, breeds, preventive and curing medicines for aqua-culture and post-harvest product consumption are totally operated by private sector, without monitoring and inspection by local authorities, so it is difficult to ensure quality and market risks are quite high.
- Lack of assistance from aqua-culture professionals: In the whole district, there are only 2 fishery engineers. At commune and village level, agriculture extension system does not have aqua-culture profession. Financial and technical assistance to aqua-culture by provincial and local authorities is limited.
- Coastal environment is vulnerable, especially by changes of water level in case of flood, storm in rainy season and coastal erosion. Therefore, it is necessary to pay more attention to using technology for dykes and drains around ponds to decrease impacts of catastrophe.

1.2.3. Selection of communes for conducting survey

Selection of 2 communes for conducting survey is based on criteria established by the research group, with participation by some important staff from district People's Committee and concerned departments (see appendix 1). Two communes that were selected are Quang Dien (coastal commune) and Duong Hoa (inland commune).

1.3. Duong Hoa commune

Duong Hoa is a mountainous midland commune in the Southeast of Hai Ha district. It is contiguous to four communes, namely Quang Phong (in the southeast and the north), Quang Lan (in the west), Tan Binh (in the south) and Quang Son (in the north). Duong Hoa has 9 villages. This is the old inner-dyke tidal flat. As located in the downstream of Duong Hoa river, effected by upstream water and tides, the commune is flooded from May to November every year.

Duong Hoa commune's natural land covers an area of 4,239 ha, including 404 ha of farming land. The commune's topography is low and sunken. Total area of coastal and estuary land is 367 ha, equal to nearly one sixth of the whole farming area. This area had been used for agriculture with one crop cultivation, but efficiency was low and unstable. Therefore, in recent years, this area has been converted to aqua-culture.[1]

There are 3 sources of fresh water in the commune, namely rain water, river water and deep well water. Most of underground sources are salted and acidic.

The commune has 703 households with 3,296 inhabitants. In the commune, there are 3 ethnic groups, namely Kinh (the majority), Dao (128 households and 651 inhabitants) and Nung (4 households and 19 inhabitants). In 2005, number of poor households in the commune was 36, equal to 5.33% of population, including 10 minor ethnic households. There were 5 households getting out of poverty and no household being repoverished. Duong Hoa is a poor and pure agriculture commune. Agriculture accounts for 87% of total production value. Industry, small and handcraft industry, trade and services have not been well developed. Labor force of the commune is abundant and exploitable land potential is great. By December 2004, in the whole commune, there were 97 shrimp and salt-water fish ponds and more than 5 ha for fresh water aqua-culture, creating jobs and income for a great number of laborers[1].

Infrastructure, especially transportation system, is very poor with the majority of earthpaths causing difficulties for travelling, especially in rainy season, failing to meet requirements for travelling and goods transportation.

Duong Hoa commune was assisted to formulate the Project on detail masterplan for aqua-culture in Duong Hoa commune in December 2004 by northern Centre for Vocational Training and Aqua-culture Technology transfer. This project covers 45 ha of coastal area belonging to Village 4 and Village 5 of the commune, which is inefficient for wet paddy cultivation. Based on Master plan for brackish and salt-water fish raising in Hai Ha district in the period 2006-2010, area for brackish and salt-water fish raising is 246.55 ha, including 244.95 ha for shripms (villages 4, 5, 6, 8), and 1,6 ha for fish (village 5).

In summary, Duong Hoa commune has following advantages and disadvantages in developing sustainable aqua-culture (consolidated from discussions with key staff of the commune)

*** Advantages**

- Large area of undeveloped natural land.
- A coastal commune with 6 km-long sea dykes. National highway No 8A runs through the commune so it is very favourable for transporting goods.
- Tidal flat land is suitable for shrimp, fish and molluck raising.
- Availability of agriculture labour redundants, mainly migrants from Hai Phong so they have good knowledge of aqua-culture.
- People want to transform inefficient agricultural areas to aqua-culture.
- Stable security and public order in the commune.
- The commune has had detail masterplan for aqua-culture development.

*** Disadvantages**

- The commune's basic infrastructure has existed (tranportation roads, dams, dykes, canals) but dedgraded. Almost all transportation system is earthpaths so it is very difficut for travelling, especially in rainy season. In many areas, roads are only accessible by motor bikes rather than cars or vans. Network of culvets and dams have been extremely degraded, causing overflows every year. Most canals are earthbuilt causing water leak. In many areas, there are no canal system so irrigation depends much on rain. Electricity is insufficient for developing sidelines and services.

- People are poor and therefore do not have enough capital for structure transformation. Demand for borrowing is great while there is no support projects.
- Scientific knowlegde is limited while structure transformation is spontaneous.
- The commune has to buy fish breedings from Hai Ninh district. In the commune, there is no centre for preserving and testing breeds so it is very difficult to ensure the quality of breeds, and people have to transport breeds in very difficult conditions.
- Lack of projects that creat jobs for farmers in non- farming period, especially for women.

1.4. Quang Dien commune

Quang Dien is a commune in coastal area of Hai Ha district. It is about 5km to the south west of the district center.

Natural land area of Quang Dien commune is 1,180.79ha, including 186.52ha of two crop cultivated land, 139.995 ha of land for annual crops, 392.41 ha of land for aqua-culture, 31.255 ha of fruit-tree cultivation land, 164 ha of forestry land and 266.65 ha of unused land[1]. The terrain is sloping from the north east to the south west, with a dense network of rivers and springs, which are originated from mountainous areas to the sea, creating ponds, langoons, estuaries and plain tidal flats. In these areas, there is much of ephemera. Their major geological composition is sand, mix of sand and soil or mud. This is favorable condition for aq such as shrimps, fish, crabs, oysters, sea-worm and sea-leech raising. Inner-dyke brackish and salt-water ponds areas for shrimp raising is about 10 ha. Most of these ponds are enclosed by firm system of dykes which is not much effected by sea waves and favorable for shrimp raising at industrial scale. The outer-dyke tidal flats where there is mixture sand and mud suitable for molluck cultivating, especially oysters; areas with mixture of soil and sand suitable for constructing salt-water fish ponds; mud areas are suitable for mangrove forests, such as aegiceras, etc.

Road and waterway are quite favorable with commune roads linking to contiguous communes. The commnune has many river estuaries and Ghenh Vo port. Main transport axis of the commune has been in the process of rehabilitation. Infrastructures such as schools,

clinics, culture houses, post offices, etc are relatively good. Villages have accessed to electrictity.

The commune has 614 households with 2,552 inhabitants, including 1,115 persons in labour force; of which 510 envolve in aqua-culture. In 2004, there were 32 poor households. In the commune, there are 5 ethnic groups, namely Kinh, San Diu, Tay, Nung, Hoa. By the year 2005, there were 10 households getting out of poverty, but 3 falling back to poverty. By 30/10/2005, there were 25 poor households left (old criteria), equal to 4.07% of total number of households of the commune.[21]

Before the year 2002, because economic development was not good and land policies were not widely propagated, some households had sponstaneously transformed their agricultural land of low productivity to aqua-culture. From 2002 to 3/2005, thanks to Decree No 10 by District People's Council on transforming land use purpose, another 34 households took part in transformation models with area of 52,922 square meters. Results of transforming inefficient agricultural land to aqua-culture were that income increased 4-5 times more than rice cultivation and other farm produces. This result has encouraged farmers to invest on tranformation models. In the period 2006-2010, another 10 ha of inefficient traditional agriculture sunken areas is planned to be transformed, increasing total transformed areas in the whole commune to more than 15 ha by 2010[2]

Quang Dien commune has been supported by the district a master plan for aqua-culture in the period 2003-2010, in December 2003. This is a scientific foundation for aqua-culture development in the commune in the next five years.

In summary, Quang Dien commune has the following advantages and disadvantages in sustainable aqua-culture development (consolidated from discussions by key staff of the commune):

*** Advantages**

- Natural cultivation areas which are suitable for molluck raising (oyster, arca); non-farming period exploitation (sea worm); dyke edged areas are suitable for shrimp raising.
- Being located in lower area, Quang Dien commune has better infrastructure than others in the district; resource of fresh water is more abundant than in others, especially mountainous communes, so provision of water for aquacuture is ensured. Located near the district centre favorable for travelling.

[21]Report on implementation of Decree 10NQ-HDNH on transforming inefficient agriculture land to aqua-culture, Quang Dien Commune People's Committee, 10/4/2005.
[2]Master plan for developing aqua-culture for Quang Dien commune, Hai Ha district in the period 2003-2010, December, 2003
[4] Report on implementation of poverty reduction programme in 2005, Hai Ha district People's committee

- Canal with water discharged from Chuc Bai Son hydroelectric lake runs through the commune.
- A bundant labour force; primary education universalisation
- Market demand for seafood is great, and these products are easily sold to private traders on the spot.

*** Disadvantages**

- Most difficulty of the commune is irrigation. Canals are earth built causing water leak. Water resource is not enough for maintaning aquaculture in certain season. Consequently, ponds' water exhausted in dry season (3 months). In this case, products are harvested too early so economic efficiency is low.
- Terrain is sloping to the sea and therefore water flows naturally. There is not any seperate canals for aqua-culture so in case disease breaks out in upstream, it will easily spread to lower areas.
- Lack of capital while there is no credit support for aqua-culture.
- Due to lack of knowledge, no effective solutions are taken when diseases break out.
- Breeds for aqua-culture and feeds for shrimps are bought from households so quality can not be ensured (fish and oyster breeds are bought from Nam Dinh, Ben Tre, Hai Phong, then farmers have to transport them to Quang Dien by themselves. Oyster and shrimp breeds are bought from Chinese private traders through middlemen, who come to Vietnam to buy seafood).

2. MAJOR FINDINGS FROM COMMUNITY ANALYSIS

2.1. Income diversification and risks faced the people

2.1.1. Livelihoods and their impacts on the poor and sustainable development

Livelihoods in coastal areas are often diverse, depends on natural resources. Consequently, those that help people easily earn their living will more or less badly affect the environment. Meanwhile, orientation toward sustainable development is not to excessively exploit natural resources and negatively affect the environment. When evaluating different kinds of livelihoods, criteria to consider are both present and future benefits (in terms of income) for the poor, sustainment of the environment (in terms of level of pollution), and availability of financial and techinical supports... from the government, local authorities and donors.

Evaluations by score were made in discussions with officials of two-surveyed communes and district (shown in table 3). Because of differences in natural characteristics of inland

Duong Hoa commune and coastal Quang Dien commune, some livelihoods only exist in one of the two. Out of the 17, there are 6 livelihoods exist in both communes.

In evaluation of impacts of livelihoods on different affected criteria by total scores, **freshwater fish raising** has the highest score. Though freshwater fish raising is spontaneous in several areas and some poor households can not implement this model because of capital shortage, freshwater fish raising, according to the poor themselves, is the most effective livelihood that can bring about stable income and poverty reduction, especially in areas with unfavourable natural conditions for traditional agriculture activities. Reasons for that are: (i) cost for freshwater fish raising has reduced as inputs can be taken full advantage from other activities; (ii) sale of products is very easy due to high demand. Implementation of model indicates that income from freshwater fish raising is four or five times higher than that of wet paddy growing. Besides, freshwater fish raising does not severely affect the environment. By contrast, fish help improve the environment by killing larvae.

The second most effective livelihood is **wet paddy and non-staple crop growing**. It is traditional way to earn money among agricultural activities. However, on one hand, because of unfavourable conditions (lack of irrigation water, high input cost), productivity of this activity is quite low and only enough for self-sufficient. On the other hand, the environment will be destroyed as fertilizers and pesticides are used during cultivation.

The third highest score is for **livestock raising**. But this livelihood has severe effects on the environment because of the fact that the poor lacks capital and techniques and are unable to invest for synchronized raising facilities. Consequently, epidemic diseases can easily occur.

Though livelihood of **coastal fishing** has the highest score in terms of improving income for the poor and creating new jobs, it only ranks the forth in total scores due to excessive exploitation, weakness of planning and management, leading to exhaustion of resources and decreased environmental sustainability.

Despite **working as hired labourer** can help the poor earn quite a lot of money but this kind of work is not stable. However, it has been taken by many farmers, especially during leisures after havest times in order to improve their income, and ranks fifth in total scores among different kinds of livelihoods.

Out of livelihoods that were not included in all three discussed criteria, **oyster and mollusk raising** should be taken into consideration. It has rather high total scores (to be at sixth position in both communes) though only developed in coastal communes. It is suitable for the poor as it does not require large investment in infrastructure, only depends on quality of

breeds and feeds can be taken full advantage from other activities. However, like when applying freshwater fish raising model, the poor will hardly be able to implement this model without financial assistance to buy breeds

Shrimp and caged-fish raising is not suitable for the poor though it can create high earnings. The reason is that it needs a lot of capital and complicated techniques.

Table 3: Types of livelihoods

Evaluations			**Affected criteria**			**Remarks**
Livelihood	**Score**	**Rank**	**Benefits to the poor**	**Environmental sustainability**	**Availability of assistance**	
Wet paddy and non-staple crop growing	62	2	20	21	21	- Paddy production can not cover costs for nitrogenous fertilizers due to high input costs, and lack of investment capital for growing season - Lack of irrigation water
Livestock raising	57	3	21	17	19	- The poor is lack of capital to invest in cattle feeds, breeds, raising facilities, and techniques - Bad impacts on the environment because under standard raising facilities - Inadequate financial and technical assistance
Coastal fishing	56	4	25	18	13	- Creating new jobs and improving income - Exhaustion of coastal resources and destroyed mangrove forests because of excessive exploitation, lack of planning and management - Financial support and techniques for manually coastal fishing are not required

						- High demand for seafood from the market
Small business	43	6	4	25	14	- There is no small business of the poor due to lack of capital
Working for others seasonally	54	5	19	27	8	- Information on demand for labor is available - Number of people working for others is small - Creating stable but not high income - Borrowing is required
Fresh-water fish raising	65	1	24	26	15	- Creating higher income than that of wet paddy growing - Fish kill larvae
Natural fish raising	13*		2	8	3	- Large investment is required - Outer-dyke ponds need to be constructed to gather natural flows of fish from the sea - Vulnerable way of doing business, leading to difficulties in credits within projects' framework
Oyster and mollusk raising	41*		17	15	9	- Investment in infrastructure is quite moderate, mainly in breed without any costs for feeds - Raised species can die of epidemic diseases. The fetid smell may occur but do not affect marine environment as deaths will become feeds for sea creatures
Firewood collected from forests	12*		4	3	5	- Difficult to sell
Afforestation	19*		5	10	4	- The poor lacks of capital

						- Financial and technical assistance is not yet available
Non-staple crop growing	5*		5	6	4	- The poor is hardly able to grow clean vegetables, their production is only enough for self-sufficient
Tea growing	13*		2	6	5	- Financial support is needed but the poor hardly meet demand for counterpart fund - Only 50% of necessary capital can be provided
Caged fish raising	16*		1	7	8	- The poor is unable to invest because lack of capital - As fish feeds is fresh meat, the environment will be polluted by waste
Shrimp raising	22*		2	12	8	- High-tech and large investment is required, unaffordable by the poor
Small and handicraft industry	8*		1	6	1	- The poor does not have enough capital and techniques
Mining	5*		0	5	5	- Workers are not the poor - There is not any kind of support
Construction material production (brick producing)	24*		7	9	8	- The poor works as employed labourers - Brick production dispose harmful smoke into the environment

(*) Livelihoods that was not included in three discussed criteria.

Box 2: Freshwater fish raising – a livelihood for the future

Though total score of freshwater fish raising is very high, benefit to the poor of this livelihood in terms of income creation tends to be realized in the future. It is because at present, only a few poor households can implement this model due to lack of capital to invest in breeds and raising ponds and there is no support in capital, breeds and techniques by the government and local authorities, except policy directions and spiritual encouragements (There have been master plans for aqua-culture, for shifting ineffective farming areas to aqua-culture). Fact shows that income from freshwater fish raising is four or five times higher than that of paddy growing. However, due to lack of irrigation water in some areas, farmers have to sell young fish (many areas only rely on rainwater, no waterway system and people have to sell young fish 03 months earlier). Consequently, income will be affected. (It is estimated that if there is enough water for irrigation, income from this livelihood will 10 times higher than that of paddy growing). In order to make this livelihood realized and stable, there is critical demand for synchronized assistance for breeds, raising techniques, prevention epidemic diseases and infrastructure for aqua-culture (especially permanent waterway systems) from the government, local authorities and donors.

2.1.2. Risks and opportunities for development of different livelihoods

2.1.2.1. Freshwater fish, oyster and mollusk raising

Strategy of fostering development of aqua-culture is supported by provincial authorities, especially in coastal areas, where non-staple crop growing is ineffective as farming land is infected by salt. Aqua-culture is an effective livelihood for coastal people, creating new jobs and improving income. Selection of aqua-culture suitable to specific conditions of locals and capacity of the poor should be done carefully. If this process is uncontrolled and unprompted, it will surely fail like what happened to offshore fishing program. It is widely agreed that livelihoods required complicated techniques and large investment like shrimp and caged-fish raising is not suitable to the poor as it is very risky and can be out of control of the poor. As a result, choice of both inland and coastal freshwater fish raising, oyster and mollusk raising at coastal tidal flats is ideal in this context as it requires only an initial investment for infrastructure and breeds; feeds can be taken full advantage from other activities; it is easy to sell because of high demand (even from the district itself). The district has had policy and plan for raising areas as well as shifting ineffective farming areas to freshwater fish raising regions in both surveyed communes.

However, this livelihood also contains risks. Most notable one, which determines success and failure of livelihood, is effects of natural conditions such as rain, flood, drought... In both surveyed communes, lack of water for aqua-culture due to inadequate harmonious waterway systems is real challenge to people. Quang Dien commune has better irrigation system than Duong Hoa commune, but it is only earth built, leading to great loss of water. Because there is no water reserve system, water is not enough for irrigation in dry season (03 months of winter) and the people have to sell young fish to avoid loss of revenue. Infrastructure system of Duong Hoa commune is very poor. The commune only has earth roads and has no concrete ones, causing many difficulties in traveling, especially in rainy season. At surveyed site in village No. 5 (which will shift to freshwater fish raising as planned), waterway system for irrigation has almost disappeared. Remains are drearily unclear traces of waterway sketches covered by brushes. The only source of irrigational water is natural rain. Besides, raising ponds can be easily destroyed by floods due to sloping terrain. People have to repair damage by heightening ponds' banks. Though some households has shifted to freshwater fish raising and gained good results, income is four or five times higher than that of paddy, people in Duong Hoa commune also have to sell young fish 03 months earlier to avoid drought like those in Quang Dien commune. As a result, quite large amount of their income is lost.

"Muddy road" to village No. 4 and No. 5

"Inner field canal"

Heightening ponds' banks to fight against coming floods

" former irrigation canal"

Besides, another risk of this livelihood is epidemic outbreaks. (In 2002, raised oysters died massively in April and October with loss of around VND 12 billions[22]). People buy breeds themselves at private providers without inspection by local authorities and investigation of breeds quality by authorized agencies. Implementation of this livelihood is spontaneous and lack of scientific knowledge. Though people in some areas attended training courses, results are limited as they mainly focused on theory rather than practice and practical model.

2.1.2.2. Paddy and non-staple crop growing

Paddy and non-staple crop growing is traditional livelihood of farmers. Fields in coastal sunken areas are easily flooded or drought, especially those without dykes or low quality ones. Hai Ha district has 32 km coastal dyke, in which only 10% are solid. Consequently, impacts of natural conditions (drought, flood) on this livelihood are significant. System of cannels for irrigation is in same situation with only 10% concreted. Exhausted soil and weak irrigation system make agriculture heavily rely on changes of weather. Besides, people are facing traditional risks as seeds and materials are not guaranteed such as fertilizers and pesticides bought from private providers, shortage of scientific knowledge for implementation of high yield models.

2.1.2.3. Livestock raising

The most critical risk of this livelihood is epidemic diseases. The poor often does not have enough money to invest in qualified raising facilities and lacks raising skill. As a result, epidemic diseases can occur easily. Massive outbreaks of poultry and cattle diseases recently have caused many difficulties in animal husbandry development to improve income for people.

[22] Master plan for salty and brackish aqua-culture of Hai Ha district for 2006-2010, December 2005

2.1.2.4. Coastal fishing

At surveyed areas, coastal fishing can create new jobs and higher income for people. Though fishery reserve has reduced significantly and fishing technique is not high, this livelihood still creates stable income for people in coastal areas. It does not require large investment for fishing equipment, especially in case of ashore fishing. People can improve their income by catching sea-leeches and sea-worms with only a rake. However, coastal resources can be exhausted due to shortage of regulations on times for exploitation. This livelihood also much relies on weather and faces risks of epidemic diseases.

2.2. Markets and their impacts on income diversification

Input market and output market all have certain impacts on income diversification. In Hai Ha district, two markets are left for private individuals without quality control by local authorities, provision of qualified inputs and breeds, establishment of commercial channels and stable purchase contracts with processing establishments by the government. Because input market is out of control while state supply system of breeds and materials is still weak and inefficient, farmers often buy low quality inputs from private providers and will easily take risks and get loss. Breeds market for aqua-culture is rather diverse in variety sources. Number of oyster raising households has been increasing rapidly since 2002. As local source of oyster breeds is scarce, 80% of white oyster raising households have to buy breeds from southern provinces and neighboring provinces like Nam Dinh or Thai Binh. Garrupa breeds (brackish and salt-water raised in inner dyke areas) is bought from local farmers, who caught them by buried-net and drift-net. Shrimp breeds are mainly bought from China without sanitary quarantine. Province has tried to improve the situation by establishing some breeds hatching farms but unable to meet demand for breeds. Station breed quality testing based in Mong Cai province and people hardly use this service because of inconveniences in transportation and traveling to the station.

Market of aqua-culture products is also very diverse. Because of high demand from domestic and Chinese markets and limited supply of local (due to low productivity), products are often bought by private merchants immediately. Fresh-water fish is even not enough for consumption of province itself. Apparently, aqua-culture farmers would not likely to face market risk in the near future.

2.3. Assistance to the poor in aqua-culture development by organizations

Policy on shifting ineffective agricultural land to aqua-culture is proper and meets demand of people. Most local people want to shift to one kind of aqua-culture suitable to their

capacity because production of non-staple crop is not effective due to exhausted soil and lack irrigation water. As analyzed above, shrimp and caged fish raising can produce higher revenue but requires high techniques and large investment, and not realistic for the poor. So, most suitable livelihoods for them is freshwater fish raising (for inner-dyke ineffective agricultural area) and oyster and mollusk raising (for outer-dyke tidal flats) because they only require initial investment for breeds and ponds, products can be sold easily, raising techniques are relatively uncomplicated, input cost is low as feeds can be taken full advantage from other activities. Though province and district have adequate policy on shifting ineffective agricultural areas to aqua-culture, the policy has not been brought into play. The reasons are shortage of support policies and mechanisms on investment in infrastructure (for example, consolidation of dykes, dams, irrigation canals, roads and electricity system), organizing training courses on scientific techniques (which focus on practices and implementation of typical models), strengthening aqua-culture professional staff for local, establishing convenient system of logistics services (breeds hatching farms; stations for breeds testing; provision of inputs, materials, medicine for treatment and prevention of diseases; purchase of produces, processing factories). support from donors is also limited. There are only SUMA Project on master planning for salty and brackish aqua-culture for 2006-2010 through Ministry of Fishery and some training courses on aquatic techniques (mainly focused on theory) through the province's Women's Union and agriculture extension centre. Central Women's Union provide a credit of VND 100 millions to Duong Hoa commune's Women's Union to support 50 women members (targeted are poor women and high-risk women to integrate into community) in order to improve economic development capacity for women in rural areas (by raising livestock and setting up small business). Credit support for the poor to develop aqua-culture (which requires large investment) is quite limited because banks consider aqua-culture risky. Consequently, it is very difficult to get credit approvals from banks, and the poor themselves are also afraid of credit as they may be unable to pay for their debts.

Box 3: Lack of investment support by provincial authorities and donors

Though the district is located at a favourable geographic position, right in the middle of Ha Long and Mong Cai, this seems a disadvantage for the district as provincial leaders hardly visit the district and their usual final destination is Mong Cai. As a result, the district hardly get support and investment from the province, the government as well as from donors.

(According to Mr. Tran Dinh Eng, fishery engineer, Deputy director of Department of Economic Issues, People's Committee of Hai Ha district)

Box 4: Mr. Nguyen Tien Nhanh – a dynamic and wholehearted village head

Whenever there are village's works, I need to travel for almost one day to announce information for all people in village as they scatter in different hills. When I became head of village in 2000, I encouraged some households to shift from paddy growing to freshwater fish raising due to ineffective agricultural lands. Initial economic achievements are remarkable. However, I was criticized seriously several times by the district and commune authorities as they were afraid of losing agricultural lands. I myself wanted to shift, but I had to obey regulation and decision of local authorities as I am a village officer. I really hope the government and local authorities support people in my village, especially for water sources, so that they will have more favourable conditions to develop freshwater fish raising.

(According to Mr. Nguyen Tien Nhanh, head of village No. 5, Duong Hoa commune, Hai Ha district)

2.4. Access to fishery resources by the poor

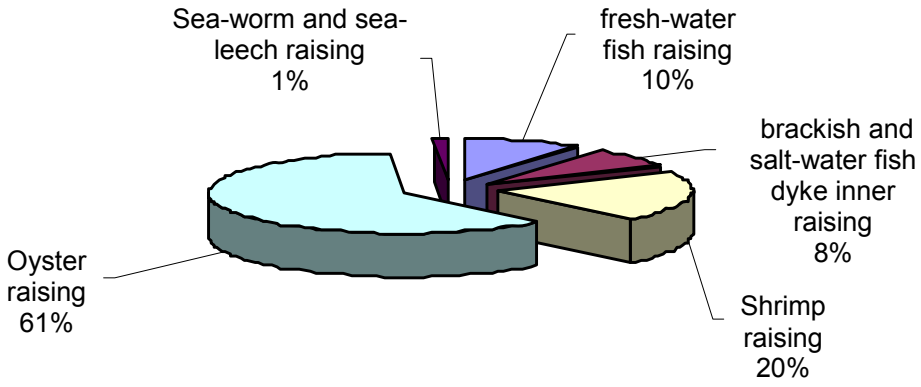
Uncontrolled exploitation of resources like fish and mollusk is a very important livelihood of the poorest households. This is a livelihood to improve income for the poor because of pressure of earning money to cover their living expenses, easy method of exploitation, low initial investment, effective job creation and not very high profit but stable income for the poor. However, it is widely acknowledged that unprompted and seasonally unplanned exploitation can cause exhaustion of coastal fishery resources. The poor people have different demands. Some groups of the poor can take part in production process and some only can work for others. Most positive change to poorest group is increased demand for labor in line with higher income. The poor in Hai Ha district has more advantages than those in other areas as they have farming land and only work for other people during non-farming period after harvest time (they do not work for others all year round like the ones in areas without farming land). Though ineffectively traditional agricultural farming is not productive enough for self-sufficiency of the whole family (with approximately 03 months under shortage of food), it is capable of earning relatively enough for living in one crop. If these poor people have sufficient capital or financial support and live in area where inefficient agricultural land is planned to transfer to freshwater fish raising, they surely can take advantage of coastal area for freshwater fish raising (in case of inner-dyke areas) or oyster and mollusk raising (in case of outer-dyke tidal flats), creating higher income and poverty reduction. If there are other supports for breeds, raising techniques, medicine for epidemic diseases and solid irrigation system for supplying irrigation water in an active manner), change would surely brings about a bright future for the poor in coastal rural areas. Once stable jobs and income can be gained through aqua-culture, working for others and exploiting coastal fishery resources will reduced, people will be look for more sustainable livelihoods.

Examination at surveyed areas showed that the poor has been unable to implement shifting model mostly because they lack initial investment capital while financial support for development of aqua-culture is still limited due to high level of risks of this livelihood. It is very difficult for the poor to get credit approvals from banks, and the poor themselves are also afraid of credit as they would not be able to pay for their debts.

2.5. Some aqua-culture models in the district

By the end of 2005, aqua-culture area has covered 1,532 hectares (see aqua-culture area structure in Figure 1) with 290 sea fish-cages and 500 mytilus smaragdinus (green mussel) net bags.

Figure 1: Aquaculture structure in Hai Ha district in 2005



2.5.1. Shrimp raising

Total area in 2004: 383 hectares, cultivated by 45 households, among which 43 households were responsible for 472 hectares of improved extensive raising and 2 households were responsible for 11 hectares of semi-intensive raising.

Shrimp breeds and origin: Shrimp breeds were imported from China, mostly unquarantined, low quality and inadequate quantity. Two shrimp breeds are white-leg prawn and sugpo prawn.

Two crops: Spring-summer (from March to June) and summer-autumn (from July to September)

Shrimp-feeds: China and Vietnam made.

Productivity: average yield of improved extensive raising is 150kg/hectare; of white-leg prawn is 285kg/hectare. Spring-summer crop yield of semi-intensive white-leg prawn raising is 2,450kg/hectare. Summer-autumn crop yield of improved extensive white-leg prawn raising is 335kg/hectare. Average yield of semi-intensive raising is 1,750kg/hectare.

Highest profit: VND 23 million /hectare (2 households). Biggest loss: VND 30 million/hectare (1 household).

Epidemic situation: as shrimps are mostly extensive and improved extensive raised, there are hardly shrimp epidemics in the district.

2.5.2. Out-dyke mollusk raising

Mollusks have been raised since 1991. By the end of 2004, 368 households has raised mollusks in 871 hectares, most of which were at tidal flats of Quang Minh, Phu Hai, Quang Dien and Quang Phong communes.

Mollusk breeds and origin: Oysters was raised in the period of 1991-2002 with breeds from Nam Dinh. Since 2002, due to scarce oyster breeds, 80% households have shifted to white oysters with breeds from Ben Tre.

Breed density: Breed density of white oysters is 1.2-1.5 tons/hectare. Size of breeds is 250-500 individuals/kg. In 2004, 550 tons of oyster breeds were raised. Price of oyster breeds in 2004 was VND 1,500/kg.

Raising period and live rate: Oyster raising period is 12 months, during which oysters grow from size of 350-500 individuals/kg to harvestable size of 60 individuals/kg. Estimated live rate is 80%.

Productivity: 3.2 tons/hectare.

Economic efficiency: each oyster raising household is provided with 2 hectares of tidal flats and makes an average annual profit of VND 25-30 million/2 hectares. The highest annual profit is VND 70 million-100 million/2 hectares.

Epidemic situation of out-dyke oyster raising: there were mass deaths of oysters in April 2004 and October 2004 but the reason was unknown. In 2004, main breeds raised were white oyster and there has been no epidemic reported.

2.5.3. Sea-worm and sea-leech raising at small-scale in concentrated manner on tidal flats

In 2004, there were 8 households raising sea-worms and sea-leeches in 33 hectares of tidal flats (3 households with 6 hectares at Phu Hai commune, 5 households with 27 hectares in Quang Phong commune).

Raising condition: for sea-leeches is sand and soft sand, for sea-worms is soft land mixed with sand.

Size and origin of breeds: breeds are collected from nature, 1.5-2.5 cm in length. Price of sea-worm breeds is VND 10,000-12,000/kg, of sea-leech breeds is VND 14,000-15,000kg.

Raising period and productivity: After 12 months of raising, yield is 1.2-1.5 tons/hectare. Price of fresh sea-worms is VND 25,000/kg, of dried sea-leeches is VND 250,000-280,000/kg.

Economic efficiency: After 1 year of sea-worm raising, each household makes a profit of VND 10-12 million/hectare. After 1 year of sea-leech raising, each household makes a profit of VND 15-17 million/hectare.

Challenge for households is difficulty in collecting breeds from nature as exhaustion of natural breeds. Meanwhile, there has been no artificial breed production yet.

2.5.4. Brackish and salt-water fish inner-dyke raising

In 2004, 37 households raised brackish and salt-water fish in 257 hectares of inner-dyke areas. Existed lakes created during sea-dyke construction have been modified to be used as fish ponds. Extensive raising method is applied. Fish breeds are collected from nature, thus, there are many varieties and miscellaneous seeds. As fish breeds are collected according to rising tide, success depends more or less on fish pond owners' techniques and on sea areas. Without feeding investment, crop yields are low (0,6tons/ha) and unsteady.

Only one household raised 3,500 garrupas, using garrupas breeds of 8-12 cm in length and feeding with fresh miscellaneous fish. This household's total garrupa raising cost was VND 89 million. An average garrupa weighs 0.9kg. With crop yield of 2,500kg and selling price of VND90,000/kg, this household made a profit of VND 136 million.

2.5.5. Sea caged-fish raising

Sea caged-fish has been raised since 2001. By end of 2004, there have been 61 sea caged-fish raising households with 290 fish cages.

Raised species: red garrupas, fat garrupas

6-8 cm long breeds are collected from nature or imported from China

Fish-feed: fresh food such as shipworm intestines, snail intestines, small shrimps, and miscellaneous fish.

Yield: total yield of 35 tons, sold at domestic and China markets. Price of garrupas (1-1.2kg each) is VND 150,000-160,000/kg; of chinese fish (5-7kg each) is VND 60,000-80,000/kg; of american fish (1-1,2kg each) is VND 45,000-50,000/kg.

Epidemic situation: fish scabies and fungus have occurred. In addition, there have been unknown-reason deaths of fish.

2.5.6. Freshwater fish raising

In 2005, freshwater fish raising area covered 152 hectares, among which 48 hectares were transformed from ineffective agriculture land. Despite short period of applying and

unprompted development, statistics shows that freshwater fish raising can bring a profit four-times higher than paddy-farming in the same area, and is sustainable and suitable for rural households.

3. RECOMMENDATIONS

3.1. Measures for income diversification

Traditional agriculture has limited potential for development as natural condition is severe and soil features are unsuitable for food crops. These low-income activities, however, still play an important role as a fundamental source of income and help to reduce shock effects. In addition to traditional livelihoods of farmers (food crop production and animal husbandry), inhabitants and local authorities have chosen freshwater fish raising (in ineffective agriculture inner-dyke area of both communes) and oyster and mollusk raising (on tidal flats of Quang Dien commune) as alternative livelihoods. Goal is to create a strong momentum for improving and diversifying income in a sustainable manner and to make use of local resources. Two livelihoods, however, have different risk levels. Risks that freshwater fish raising households usually face are natural calamity (drought) and epidemic that can be overcome. Oyster and mollusk raising households, in contrast, not only face above risks, but also have to bear risks of storms that cannot be surmounted. risk level of oyster and mollusk raising, therefore, is much higher than freshwater fish raising.

Targeting inhabitants' income diversification, especially for combining stable income livelihoods with coastal advantages and resourse using, policy of transforming low yield paddy growing areas to aqua-culture and planning aqua-culture zones alone is not sufficient. There should be numerous comprehensive support mechanisms and policies to minimize risks for aqua-culture households.

***Financial measures**

- Capital-lending policy: lending cycle should be 2 years so that farmers do not have to sell young fish. Suggested interest rate is preferential one. Average credit amount of VND 25-35 million/household is advisable for 5 perches of freshwater fish raising greenfield investment. As the poor has limited capital mobilization capacity, it is necessary to take into account rational level of tied-counterpart fund requirement.
- Credit modality: Loans can be provided to groups of households in order to strengthen mutual support in case one household meet with misfortune and to improve community's supervision responsibility.
- Reschedule policy for unfortunate households.

Box 5: Mutual assistance in fish pond construction – seems to be easy but in fact is infeasible when people are still busy with daily subsistence.

Major investment for freshwater fish raising is spent at begining stage, mainly for fish pond construction. To build high edges for flood preventing, great labor is required. Cost is VND 5-7 million /perch. Average pond area each household has to build is 5 square perches. Total cost, therefore, is around VND 25-35 million . Solution is labor hiring but not mutual help as everyone is busy earning his livings and has no time for labor exchange.

(opinion given by a male group from village No 5, Duong Hoa commune, Hai Ha district on 8th March 2006)

*** Market and price related measures**

- Develop state owned system of fishery logistics in district and communes to ensure quality and to stabilize price of inputs such as breeds, feeds, materials and medicine for raised species. Commercial mechanism should be flexible (purchase, deferred loans) to compete with private ones.

- Establish close relations with processing firms in breed purchasing and providing.

*** Support policies by Central and local governments**

- Integrate capital sources, concentrate investment on strengthening and comprehensively improving infrastructure for aquacultural development (dykes, dams, culverts, cannels, roads and electricity). Irrigation system should be inter-communal. Active irrigation system is essential for efficiency improvement and risk reduction in aqua-culture.

- Reinforce local government's inspection on quality and price of private fishery logistic system. Encourage private companies to expand service networks to communes and small villages to facilitate farmers' production.

- Develop centers for hatching and testing breeds for district and commune groups.

- Develop information centres in communes to provide aqua-culture knowlegde and techniques as well as information about aquatic and seafood markets.

- Organize more training courses on aqua-culture that focus on practices and demonstrations.

- Strenthen aqua-culture staff at local level. Establish fishery extension network to villages (village heads or experienced and competent ones as selected by people).

- Foster development of local processing establishments to take advantage of capital and techniques from external partners (like medusa processing model in Cai Chien island).

- Develop aquacultural risk insurance policy.

- Establish hydrometeorology observation system for timely warnings in order to minimize aqua-culture households‘ risks, especially in sea raising area and tidal flats.

*** Other measures**

- For geographical and natural condition of project area, it is necessary to pay attention to harvest time to prevent bad effects from natural disasters (drought and flood), to minimize risks to increase responsibility of project participant’s commitment.

3.2. Selected models

3.2.1. Project owners

With general guidelines of supporting the poor and improving management and supervision capacity for community, in principle, project owner should be local authority. Surveyed communes, nevertheless, have not yet received any financial support so far and have had no experience in project management and aqua-culture professional staff. As a result, in order to bring into full play efficiency of financial assistance, district-level authority should be project owner at initial stage to guide commune authorities and community to perform recipient’s commitments. Besides, two fishery engineers of the district can efficiently support project participants.

3.2.2. Project area and beneficiaries

Planned destination of Project “Assisting poor community to develop sustainable fishery” is area planned by the district for fisheries development in period of 2006-2010 in Duong Hoa commune (Village 4 and 5) and Quang Dien commune. There have been some initial successful shifts in the area. Despite pro-poor goals of the project, 20% of beneficiaries should be those who have applied model (middle level households), so that they will share their experience and techniques to the poor beginners. This will help to reduce risks as on-the-spot and timely support from aquaculture staff of the district is limited for understaff and large area difficult to access, especially in rainy season.

3.2.3. Selected livelihood models

Without fundamental foundation (infrastructure for aqua-culture), in order to build an area specialized in commodity products (aquatic and seafood), existing one paddy crop is definitely still indispensable for daily food security in unefficient agriculture land in Duong Hoa va Quang Dien communes. Nevertheless, in spite of aqua-cultural development potential of a coastal land, inhabitants can hardly alleviate poverty if they are tied with this traditional livelihood/poverty alleviation is unfeasible with this traditional livelihood alone. ***Based on detail master plan for brackish and salt-water aqua-culture of Hai Ha district for the***

period 2006-2010 using SUMA technical and financial assistance, and on survey among inhabitants and local authorities about shifting low yield agriculture land to aqua-culture area, research group find that paddy growing together with freshwater fish raising (in ineffective agriculture inner-dyke areas of Duong Hoa and Quang Dien Communes), and oyster and mollusk raising (on tidal flats of Quang Dien Commune), accompanied by supports of irrigation infrastructure, financial credits and techniques, are livelihood that will bring about great improvement of income for inhabitants in coming years. These can be considered sustainable livelihoods, based on appropriate uses of coastal natural resources and bring stable incomes to people. Moreover, with economic efficiency provided by those livelihoods, people will reduce livelihoods used to be applied for better income that have negative effects on environment and sustainable development (such as unplanned coastal fishing without obeying seasonal and technical regulations which cause coastal resource exhaustion; firewood cutting; construction materials exploitation, etc.)

3.3. Support modalities

It is shown that though income from freshwater fish raising (in both communes), and oyster and mollusk raising (in Quang Dien commune) will be several times higher than that of traditional agriculture, the poor cannot participate in shifting model as lack of initial investment and techniques of monitoring, epidemic preventing and treating for raised species. Most important requirement for risk limitation in aqua-culture is comprehensive improvement of aquaculture infrastructure (dykes, dams, culverts, cannals, roads and electricity). This, however, involves large, inter-district and inter-communal investment that one donor cannot provide. It is neccessary, therefore, to combine aid with other funds, especially public rural infrastructure investment. ***"Disadvantage" of Hai Ha district is that it locates in Quang Ninh province that have relative economic potentials (so it can hardly attract government and donors' pro-poor projects, except very few projects in Program 135) and is even only 30km away from Mong Cai town (while province is concentrating investment on strategic focal economic areas such as tourism development in Ha Long Bay, seaport system and border line economy development in Mong Cai). As the result, Hai Ha District seems to be "investment and financial aid abandoned***". With district's limited capacity in private capital mobilization and financial support, aid is in urgent need by inhabitants in Hai Ha district generally and those in project areas of Duong Hoa and Quang Dien communes particularly. With one donor, it is better to focus aid on most urgent needs of people that can be financed by aid package, included the followings:

- Water-supply irrigation system: In many areas of the district, people still have to rely on rain-water as there are no cannal system. Where earthcannals exists, water

shortage still occurs in 3 months of year, so farmers have to sell young fish. Therefore, based on financial support level, investment selection can be either solid cannal system (for long-term) and water resourvoir (for short and medium term) and that is suitable for people's needs.

- Credit loans: Credit loans should be provided to groups of households, with duration of 2 years, lending amount/credit limit up to VND 25-35 million/household and preferential interest.
- Investment support for building freshwater fish breeding stations (based on province's plan)
- Organize training workshops to disseminate raising and epidemic prevention knowledge; concentrate on practices and demontrations.
- Set up fishery extention network at village
- Support establishment of aquaculturemedicine stations at village-level.

Appendix 1: Selection of communes for conducting survey

To select 2 communes for conducting survey, research group established some criteria as follows:

- *01 inland commune and 01 coastal commune represent the district:*
- High poor household incidence
- Diversity in races
- Demand for and capable of structural transformation with favourable conditions for aqua-culture
- Transparency by local authorities
- Paricipatory capacity and commitment of people

Results after consulting district staff are as follows:

Quang Dien (coastal):	7/7
Quang Thinh (inland):	3/7
Duong Hoa (inland):	3/7
Quang Đuc (inland):	1/7

Although Quang Thinh commune has higher poor household incidence, its land area is small with no land for aqua-culture development. As a result, two communes selected for survey are Quang Dien (coastal) and Duong Hoa (inland).

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VIETNAM

ENGAGEMENT OF POOR FISHING COMMUNITIES IN THE IDENTIFICATION OF RESOURCE MANAGEMENT AND INVESTMENT NEEDS

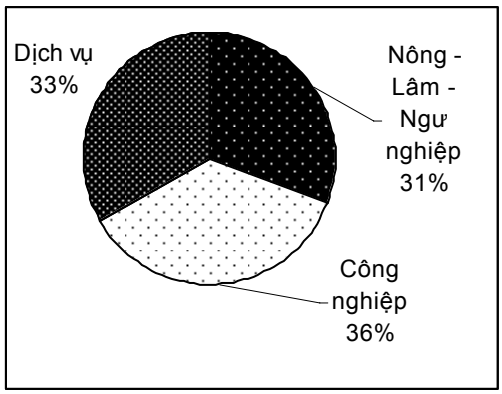
NINH BINH PROVINCE

1. GENERAL INFORMATION ON THE SITUATION OF THE SOCIO-ECONOMIC AND ENVIRONMENT DEVELOPMENT

1.1 Ninh Binh province

Ninh Binh is in the South of Red River Delta with the natural area of 1,400 km2, and the agricultural land is 67,000 ha, in which farming land is 55,000 ha; forestry land is 13,000 ha; natural forest is 10,400 ha and over 20,000 ha is rock mountainous land with limestone reserves of billions cubic metre; forest and mountains occupy 22% of the natural area of the whole province.

In the period of 2001 – 2005, the average growth rate of Ninh Binh is 4% per year. Income per capita is 3,3 million VND, i.e, 2,2 times more than in 2002.



In coming years, Ninh Binh province will focus on enforcing the shifting of economic structure, facilitating industry development, tourism services and export.

In agriculture, the goal is to develop towards commodity production, increasing the rate of breeding, and aquaculture.

Three key economic zones of Ninh Binh are determined to be coastal area, mountainous area and plain. Among those, the coastal area will focus in expanding aquaculture and develop an area for sedge material.

Particularly, for aqua products sector, because Ninh Binh has only one coastal district, Kim Son, therefore, the district play a key role in the development strategy of the whole province, even in aqua product fishing and raising in salty water, fresh water and brackish water. Besides, only several sunken areas in two districts Nho Quan and Gia Vien are able to develop fresh water aquaculture in

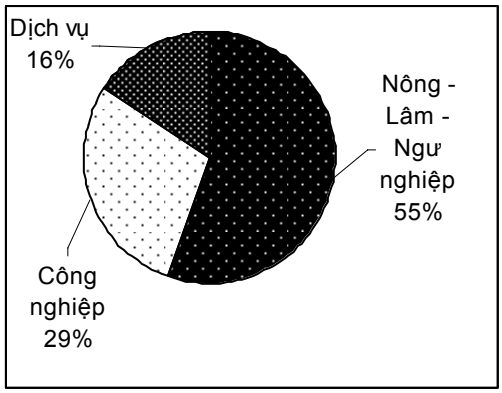
1.2 Kim Son District

As mentioned above, Ninh Binh has only one coastal district, therefore, this survey was totally conducted in Kim Son.

The area of Kim Son is 20,570 ha and the population is 174,500 people.

In terms of geographical position, Kim Son District is 27 km away from the town of Ninh Binh towards the SouthEast. It has border with Nghia Hung District (Nam Dinh province) in the East, with Nga Son District (Thanh Hoa province) in the SouthWest, with Yen Khanh and Yen Mo districts in the North and NorthWest, and by the sea in the South.

Agriculture is the key sector in Kim Son, which occupies over a half of the province's GDP.



Several targets for 2005

- Rice output: 84,660 tons
- Sedge (dried) output: 6,499 tons
- New salt-marsh plantation forest: 100ha
- Output of pork: 4,567 tons
- Output of exploited aqua and sea products: 2,075 tons
- Output of raised aqua products: 4,229 tons

1.3 Selection for survey areas

The two areas in Kim Son selected to be the survey areas are in commune and farm.

Areas for interview:

District	Commune	Target group	Characteristics
Kim Son	Kim Dong	Poor women in fishing households	Coastal region
		Men in fishing households	
		Village heads	
	Binh Minh	Poor women in agricultural households	Plain
		Men in agricultural households	
		Leaders of the farm	

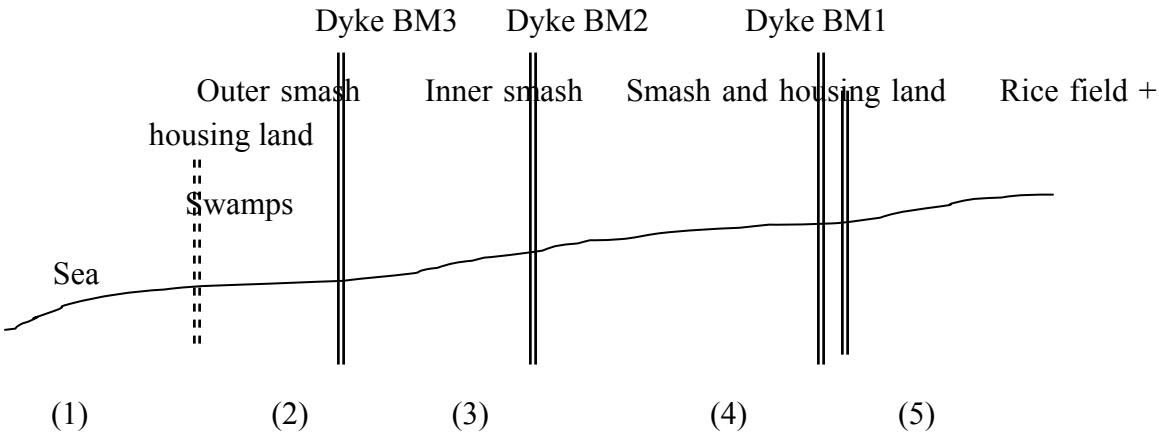
Kim Dong was established in 1998 originated from a coastal alluvial ground, which lied between the two dykes Binh Minh 1 and Binh Minh 2. Because it locates by the sea, Kim

Dong is the commune with the highest density of aquaculture among other communes in the district.

Binh Minh Commune locates inside the dyke Binh Minh 1. In terms of administration, Binh Minh commune consists of the total area of Binh Minh farm and a farm town. In terms of production, since most households in the commune are farmers, all production activities here are in agriculture,excluded some households who run their own businesses.

Binh Minh Farm is producing rice and sedge, in which, sedge tree is their advantage with handicraft products manufactured at work and exported to many international markets. In addition, cattle and poultry breeding, fresh water fish raising are also supportive livelihoods of the people here.

Transects diagram



(1) Fishing

Offshore fishing

(2) Fishing, natural fishing

Raising oysters

Afforestation in salt-marsh region

The region (1) & (2) are managed by the district authority and the coastguard office

(3) Inviting bids for raising in a large area (2ha per smash)

Raising breeds + natural breeds from the sea (due to the dyke BM3 still has a breach)

Growing grass to protect the smash

The region (3) is for bids

(4) Small-scale raising (1-2 acres per smash)

Raising fish in fresh water

	Growing rice and sedge	The region (4) & (5) are managed by
(5)	Raising fish in fresh water	the commune authority
	Growing rice and sedge	

2. Sources of livelihood

2.1. Agriculture

Kim Son has the potential of agriculutre with the advantage of rice growing. This is the granary of Ninh Binh province. Thanks to the agricultural area of 11,500 ha, in which 8,170 ha are for 2 crops, the annual total food output of Kim Son is between 95 – 100,000 tons (equals to 1/4 of total output of the whole province). On average, the annual food output is between 560 – 590 kg per capita. In addition to assurance of food security for the district, annually, Kim Son has an extra amount of 30,000 tons food for manufacturing and raising.

About 37 – 40% Kim Son's annual total food output are special rice. At present, Kim Son is one among few localities, where Tam rice breed is continually maintained. Although this rice breed is not as popular as that of Hai Hau, Kim Son's Tam rice is also a famous kind of rice with high economic value.

Due to low land conditions, several rice fields in Kim Son are sunken, and only used for cultivating one crop. In past years, the district planed to encourage rice-fish model development . It means part of sunken fields are dug to be ponds, and ponds are used for raising fresh-water fish. Meanwhile, soil collected after digging pond are used to embank the rest of the field, hence, the rice field for 1 crop turns to be 2 crop field.

Besides, similar to the majority of farmers'households in the North, pork and poultry raising, in small scale, takes advantage of available food sources, is also a popular livelihood in Kim Son. Women usually appreciate this kind of livelihood because of small investment capital, which is possibly borrowed from women's credit funds and not risky. Nevertheless, due to limited scale, income from this livelihood is unremarkable.

2.2. Sedge planting

Kim Son has ideal environment for sedge tree development. It has brackish water, which makes up the pliableness and firmness of the sedge tree. Sedge planting is a traditional trade. At the moment, sedge planting area in the whole province is 1,000 ha. Most sedge trees are planted in Binh Minh farm in Binh Minh commune.

Kim Son soil can be used to plant both rice and sedge. Rice fields in Kim Son have never been fallowed. When needed, it can be changed from rice grDue to sedge planting and vice versa without pending time.

Kim Son District intends to build a sustainable region 1,500 ha of sedge material. However, this is only of long-term planning. Therefore, preservation and development of sedge planting as well as handicraft trades using sedge material depend on many other elements such as markets, price, etc.

2.3. Aqua and sea product fishing

Offshore fishing in Kim Son is underdeveloped. Up to now, there is only one co-operative with 2 acting boat-team in this field. Due to terrain of horizontal territorial waters with a mountain blocked outside, it is not very potential for offshore fishing. Statistics shows that annual income from this activities is inconsiderable:

Year	2001	2002	2003	2004	2005
Output (ton)	900	540	400	470	280

Recently, several surveys on the possibility to build a port in Kim Son have been carried out but in fact, no certain foundation has been set for the future of offshore fishing in Kim Son.

Besides, this livelihood does not affect local economy because number of workers in this livelihood is low, and fishing and trading are not popular in the district.

Due to the fact that fish reserves in coastline of Kim Son are quite low, aqua and sea product fishing in the coastline is not a main livelihood of the Kim Son people . However, for some households, especially poor ones, this is an activity of considerable income.

The main fishing method is to use the weirs. Several households use the electric primers, although they know that this method is harmful to the environment.

Fishing activity is mainly carried out in the alluvial ground ouside the dyke Binh Minh 3. This region is managed by the district authority and coastguard. In previous years, Kim Son people freely exploited natural sea product here but in recent years, this region has been under a managemen plan. Therefore, households doing free fishing have to move to the dyke Binh Minh 3.

Alluvial warp is divided into small plots (with 200 - 300 m for each dimension) and call for tender, and price for leasing is 1 to 2 million per plot per year. There are more than 1,000 plots like this. The contract winners are often people in the commune, no one from the neighboorhood. As the tender was organized and coordinated by District and Border Guard Military service, people from various communes of the district can participate.

The exploitation heavily depends on natural conditions and crop. In case of favourable condition, owner can earn as much as 30 millions dong per plot.

Sea products from natural harvest includes mainly small shrimp, crab, fish. Part of harvest is used as breed for aqualculture, and other used for production of feed for livestock and food processing.

Sea food processing is not a prevalent livelihood activity although many household involved in this trade. There is only 1 household involved in processing in professional manner, with products sold in commune and district market. Other households are engaged in processing at very small scale, and their products are used mainly for self-sufficient and retail sale.

2.4. Aqualculture

Kim son has potential for aqualculture development. After the successful performance of pilot project on raising tiger shirmp in 1996, since 2001, Kim son has developed sea aqualculture as key district economic sector. Up to date, total area for sea products production in Kim son reachs 2,056 ha (in 2005), including area inside and outside Binh minh sea dikes. Total annual yield came up to 2,935 tons, mainly tiger shirmp, crab with total value of 196.15 billions dong. In addition, alluvial warp area of 500 ha offshore in Kimson can be used for oyster raising. In the near future, Kim son is going to project a brackish water aqualculture with industrial technology on 43.67 ha of Kim Trung commune.

Despite short time development, this trade becomes the "hostest" livelihood, attracted large number of households, from provincial officials to ordinary people in Kim son.

Main reason for people's interest in this livelihood activity is that aqualculture can bring high profit in a relatively short time. With this advantage, aqualculture is the first priority for socio - economic development strategy not only for Kim son district but also for Ninh binh province.

Raising brackish aqualculture required large volume of fresh water to regulate salty degree, and that may lead to deficit of fresh water in the long run or making onshore undergound water salty. For other coastline area of Vietnam, such as Southern Central regions, because of over-use of underground fresh water for aqualculture, the fresh water resources became deteriorated for recent 10 years. That lead to serious deficit of fresh water not only for aqualculture but also for other livelihood activities such as rice crop and other daily requirements. For Kim son case, there is no clear impact of that as the district is located between 2 estuarines, but in the long run, continuous exploitation in this way may affect the sustainabililty of environment in case of aqualculture area expansion.

Drainage of waste water directly from ponds into canals without any treatment process caused water pollution. It not only has negative affect on aquaculture (due to disease spreading pond to pond) but also affect other livelihood activities (cultivating, raising) and community health.

Aqua product raising zones invasion in coastal defensive forest even worsen the environment and weakens storm prevention.

In addition, if aquaculture is developed turbulently, it is essential to take the market's impacts into consideration. Because there is no investment on products processing, products

need to be consumed promptly after harvest. Therefore, price is also concerned by the producers.

However, until now, Kim Son has no certain plan for livelihood development. Kim Son people make a "formula" as followed: "Before the 1990s, rice enroached sedge, sedge enroached aegiceras, aegiceras enroached the sea. Nowadays, rice-fish enroach sedge, ponds enroach aegiceras, aegiceras enroach the sea."

3.5. Off-farm activities

Rice and sedge growing is accompanied by handicrafts. Take advantage of labour force in leisure time after harvest and available source of materials, Kim Son people produce many handicraft products such as sedge mat, sedge sandals, sedge bags, etc. Although this is not a key production but handicraft trade plays an important role in utilisation of redundant labour force and income generation for Kim Son people.

After changes in socialist countries in Eastern Europe, Kim Son lost a large number of partners. The sedge trade was in crisis. People destroyed sedge trees and changed to rice growing. Sedge area was significantly decreased. In past years, sedge trees have been recovered. Sedge products are not only available in many parts of Vietnam but also in various international markets such as German, the Netherland, Japan, Taiwan, and so on.

3. Conditions for livelihooddevelopment

3.1. Natural resources

Advantages

In general, Kim Son is a region with favourable natural condition. It locates between Day River and Can River. Inside Kim Son, there is Vac River (also called Tri Chinh river), a branch of Day river flows from Ninh Binh town to the gate of Day River. An River crosses the district, then links to artificial rivers, which are used to be borders for villages, communes and make up the horizontal and vertical system of rivers, convenient for traffic, irrigation and agricultural production.

Water supply for agricultural production in Kim Son is from natural source, based on principle of tidal movement. Therefore, it is unnecessary for Kim Son to build pump stations to regulate water but only open or close watergates of water inlet sluice to regulate the amount of water inside rice fields. In addition, this source of alluvial irrigated water fertilise rice fields. During crops, farmers in Kim Son are able to save a considerable amount of money because they do not have to purchase fertilizer.

Besides, Kim Son is the only coastal district of Ninh Binh province with coastline of 14.75 km length and coastal region of 6,000 ha. Coastal land area continually expands. Annually, the alluvial ground of Kim Son enroaches towards the sea by 80 – 100 metres.

Difficulties

Due to the fact that most livelihood are based on and directly affected by natural condition, therefore, natural disasters are always threat for life and production of Kim Son people. Especially for households living and doing business outwards the dyke Binh Minh 2, the sea brings them livelihood but sudden changes of the sea also takes away life any time.

At present, Kim Son faces downgraded environment problems (polluted water, increasing salty, etc.), which affect key livelihoods of people such as rice growing, aqua products fishing and raising, and so on.

This is one of the greatest community concern. Most people are aware of the importance of coastal protection forest for the protection of coastal dyke and improvement of water environment. They also know that for coastal protection forest, natural disaster impact is usually more serious than in other regions.

Nevertheless, it is difficult to apply ideas into reality. If drainage of dirty water without processing through channel and sea can be blame on out-of-date infrastructure (hence, it is possible to be repaired by State's investment). However, rashly waste disposal of dead bodies, ill aqua product, which results in epidemic spreading, is supposed to caused by weak awareness of raising farmers. They not only cause loss for themselves but also affect the community.

For aegiceras forest, in addition to capacity to control alluvium and enroaching to the sea, it also plays the role of a natural filter net, which prevents physical wastes and keeps water source clean. In the last 10 years, salty-marsh forest area of Kim Son has remarkably downsized due to eruption of exploitation of coastal land for economic objectives. Nevertheless, being aware of the importance of salt-marsh forest, newly plantation and increasing aegiceras area is considered as an urgent and long-term task for Kim Son. At the moment, 2 projects of aegiceras plantation on tender soil in Kim Son, one is funded by Japan and the other is Government's Project 661.

2.2. Human resource

Advantages

In Ninh Binh, Kim Son people are well-known for their dynamic characteristic. They are always the first movers and find out new directions for economic development.

Sedge planting trade is labour-consuming, 3-4 times greater than in rice growing. It is likely to be the reason for the hard-working characteristic of the people here.

Leisure labour after harvest is used in sedge trees production such as sedge mat weaving, and knitting.

Besides, quite a large number of young people in Kim Son leave home to work. Their destinations are often industrial zones in the south such as in Dong Nai, Binh Duong or coffee farms in Lam Dong.

Difficulties

Main difficulties are in aquaculture because this is a rather new livelihood for Kim Son.

Ninh Binh has no local Department of aquaculture. Every matter related to aqua product sector is managed by Department of aqua products protection and development under local Department of Agriculture and rural development. Besides, the province has established a Steering Committee of sea economy consisted of Chairman of Province People's Committee and representatives from local Department of Agriculture and rural development, Department of Finance and Department of Planning and Investment. This part is in charge of: 1) protect and develop protectionforest, 2) build and protect coastal dyke, 3) raising and fishing aqua and sea products, 4) sedge trees plantation

Due to the fact that this is a new field and developed in such a short time, officers of Division of sea economy are all senior ones and have to responsible for new task. At present, there is still a shortage of technical officers in of aqua culture in Kim Son.

Because of poor professional knowledge, Kim Son people have to face many difficulties in production process:

- Right from process of preparing the ponds, because farmers do not conduct in compliance with correct process, therefore, hygiene standards are not applied, causing epidemics.

- In breed selection process, due to lack of experience and assistance from technical officers, farmers can not to ensure quality of breeding stocks.

- In terms of food, in one part, to take advantage of available source of breeds and in another part, as unawareness of households about technical requirements, households produce food in their own way that meets no standard. That's not only badly affected productivity but also decrease disease prevention for aqua products raised.

- In terms of water, as district water regulating system is run by the irrigation and agriculture officers, sometimes, the quality of supplied water is inappropriate to aquaculture or the water regulation is not irrational.

2.3. Finance

Difficulties

Lack of capital for investment in production is such a problem in Kim Son. Two of the reasons are discussed below.

Firstly, all coastline land is used for aquaculture which requires a huge initial investment (even too huge if compared with popular activity in other rural areas, rice growing). Although probably considered as an economic field of superprofit, it depends on the climatic condition and other risks, hence, possibility of crop failure is very high. Therefore, once farmers use self-supply capital, they face failure for the first crop, losing both debt and profit, then they have to invest in new crop. This is beyond the ability of farmers.

Secondly, for majority of farmer households, loan from Agriculture and Rural development Bank is such an important assistance source of capital. It is quite simple to access this source of capital (while assisitance of Social policy Bank is only eligible for households who are poor according to regulation) and the loan is rather big, which can meet investment requirement. Nevertheless, to be eligible for loan, households need to have collaterals. For households, in general, the only property that can be used as a collateral is certificate for right of land use (Red book). However, because Kim Son always has new land (got by enroachment towards the sea), communes have been established for a short time, hence procedure has not been completed yet. As a result, many households are unable to access credit assistance of banks.

Box: Expenditure for aquaculture

(calcutated in unit: 1 acre of pond)

Dig pond: VND 10 million

Channel inwards pond: VND 1 million

Irrigation fee: VND180,000

Manage and maintain channel inwards pond: VND 66,000

Breeds: VND 5 million (shrimp), VND15 million (crap)

Raising food: VND 6 million

The Bank now loosen regulations. Household that has no certificate of house and land possession are permitted to mortgage by determining the house value.

2.4. Infrastructue

Advantages

Canal system built by the time that Nguyen Cong Tru came to explored and established villages still remain and are useful until now. In newly established areas, the local authority built level 1 and 2 canals system.

Difficulties

Several areas have to face difficulties in supply and drainage water as canals are not synchronic. For some canals, because height and low of areas were not properly calculated at the beginning of construction making water flows backwards but not downwards as expected, and causing disorder in the system of water supply and drainage.

Because in previous time, canals was built to support agricultural production but now it is changed to be used for aquaculture, hence, waste water from raising ponds directly flows into canals without any treatment process. It causes environment pollution and spread epidemics for aqua animals raised.

Besides, waste water of households also flows directly into these canals.

4. Several integrated livelihoods

Model	**Favourable area**	**Economic**	**Sustainability**
Rice –Sedge (substitutive)	Whole area inside the dyke Binh Minh 2 inwards.	- Low investment - Rice does not bring people high income (only 2 millions VND per ha per year) because of limited amount of farming land and productivity while it can be easily sold and stored. - Sedge is of higher economic value (three times higher than rice) but depends on market price.	- Stable livelihood with high subsitutive characteristic and relative sustainability in terms of environment (if of plant protect chemicals are rationally used). - Water used for rice growing must be absolutely fresh water. The sedge tree is able to exist in the water with salinity of up to 5%. - Rice: 2 crops per year

			Sedge: Planted once for 7 years.
Rice – fresh water fish (combination)	Flood plain region inwards the dyke	- Few investment - Rice: as above - Fresh-water fish: more valuable than rice, consumed in the local market.	- Change flood plain to be rice field + fish pond probably facilitates farmers to cultivate 2 crops instead of 1 crop per year (because field is heightened). - Fishes raised in ditch water, therefore, it not water-effective.
Brackish water fishe – shrimp - crap (substitutive)	region outwards the dyke Binh Minh 1	- Small investment is poured into fish raising while its economic value is quite high (about 10 millions VND per ha) - Shrimp, and especially crap need huge investment but economic values are high, if there is bumper crop, profit would be 30 million ha.	- Brackish-water fish is highly adaptive for shifting to raising environment (salinity of water, temperature, and so on), not risky in terms of epidemics and diseases. - Raising shrimps and craps is risky due to unstable raising environment while their adaptableness is low - Having much impact on environment (resources of water and waste water, etc.) - Possible to change aqua product for raising after each crop (year)
Afforestation in salt – marsh soil – exploited sea product in coastline (combination)	region outwards the dyke Binh Minh 3	- Inconsiderable investment - Much depends on natural conditions - Unstable income but better if the weather is favourable.	- Sustainable for a long term as contributed to improvement of the ecological environment. - However, it is necessary to not use harmful methods such as using electric primer, or chemicals, etc.

Cattle (pork, buffalo, cow) and poultry raising is likely considered to be supportive livelihood for households who cultivate rice because they can make use of by-produce from rice to produce fodder and vice versa, use muck to fertilize fields.

Handicraft and production of sedge items are also supportive livelihoods for households who cultivate rice + sedge because the number of labour in leisure time after harvest would be used (for households cultivating rice) and the available materials would be used (for households planting sedge).

5. SOLUTIONS AND SUGGESTED POLICIES

5.1. Infrastructure investment scheme conform to economic resources development

Up to now, livelihood projects in Kim Son tend to unpromptedly developed. Due to turbulent and disregulated expansion of seafood breeding activities in recent years, the ecological environment has been severely downgraded, which caused numerous difficuties to other means of living in the region.

In order to ensure stablity and long term solidarity of Kim Son's livelihood, local authorities need to set up an overall and detail development scheme for eacg fields. Besides, it is also essential to have various livelihood projects and conform to financial scale and capacity of every household.

5.2. Diversification of livelihood resources, strengthen environmental and social development

In general, livelihood activities in Kim Son are rather plentiful. Each kind of livelihood has its own natural and social advantages. Nevertheless, each of them has created some difficulties to every household's economic viability as well. Majority of livelihood projects are in agricultural and fish-breeding while off-farm activities accounts a modest percentage. But most disadvantages originate from natural and social conditions such as weather changes, limited farming land, market and price changes. As a result, diversification of livelihood projects is highly appreciated. In reality, most households in Kim Son have other activities beside production to afford life.

Moreover, local authorities need avoid wild, rough and movement-alike mechanism changes. For example: decision of shifting all rice-growing into aqua breeding and planting in Kim Dong commune.

Box: It is said that shrimp-breeding is of high profit but there are nobody become better - off, they are getting poorer.

After two dicussions with two different groups in Hamlet 1, Kim Dong commune, it is concluded that the only reason for their increasing poverty is their private shrimp-breeding ponds and lakes. Just 2 years ago, to afford life, most farmers in Kim Dong

chose to grow rice while few chose aqua breeding and planting. Last year, all household in the commune switched to shrimp and crab breeding activites. Water supply for channels are mostly brackish other than fresh one. Consequently, ignorance of breeding and planting techniques, many local households must turn their paddy-fields into aqua breeding and planting ponds and lakes.

Local farmers are completely ignorant of the reasea why series of their shrimps and crabs died for diseases. The reason for this situation are either: poor quality breeds, bad breeding techniques. Farmers in Kim Dong are in danger of second running crop failure.

Due to huge investment, bad debt credits, households are getting deeper and deeper in debts. They said: "*If we had kept planting rice, perhaps, we would have had a big cane of rices hidden in warehouses. At present, there is no sign of shrimps and crabs and we have to buy rice for survival."*

Currently, most paddy-fields are turned into ponds and all family members are dependent on the only life-earing soures. If crops keep failing, they will lose all like "*Crabs come on surface, dead, my mother have no place for cultivation*".

Besides, in deployment of each livelihood project, it is essential to consider the solidarity of its own and related ones. For instance, we must judge the fact that aqua breeding and planting can polute water resources. It effects not only future development of breeding activities but others like rice-planting and sedge-planting as well. An official in Binh Minh plantation is quoted as follows: "*In order to invest in aqua breeding and planting, we need judge all long term benefits instead of a five-year period."*

5.3. Set up various methods to avoid financial risks

As for objects, it is neccesary to completely and specifically evaluate all risks to avoid accumulating debts. Loan grace period extended, set aside previous loan are suitable but temporary methods. For long term, proper investment directions for each subject need to be established.

In modern ecnonomy, factors like market and prices are often given top priority by producers. Due to ignorance of market tendencies and just follow the crowd, rice-planting activites in Kim Son are quite stable. However, the harvested rice just guarantee food provisions and not much for secondary activities like breeding etc but not developed into a commodity industries. Mostly, other livelihood projects unstable (area of sedge planting land changes unsteadily, depending on market prices of sedge, the same as purchasing price of aqua breeding and planting products).

5.4. Paying more attentions to the poor's chances of accessing natural resources

The poor proportion in Kim Son (3.5%) is smaller than that of total Ninh Binh's figure (6.2%). However, on discussion about econonmic development scheme for the whole province, the poor can not be put aside. The question is that: "Is it possible for the poor to adapt to changes in economic development model in water territory?"

The poor can conform to livelihood projects which do not require a great amount of investment and heavily depend on resources like agricultural or craft industry.

On the contrary, aqua breeding and planting activities always demand a huge investment, high skill and put profitable land for the poor at risk. In reality, ponds call for bids to local or non-local contractors bring relative economic efficiency while ones emploited by local residents have no opstimistic signals. In case of crop success, it is a highly profitable livelihood project. But if any failures happen, owners must have an preserve fund to continue investing in the following crop. Because the poor do not gain initiative of capitals, their first investments mostly originate from credits. Once they failed in a crop and creditors refused to continue providing credits, the poor have no way to maintain their business. They do not know what to do to pay off interest and principal, let alone gaining wealth for themselves.

Box : A miss is as good as a mile

Mrs Nguyen Thi Gam's family has settled in Hamlet 1, Kim Dong commune since 1993 (Kim Dong commune was decided to officially set up in 1998). In the area of 1.75 hectares, they planted one rice crop, together with breeding and knitting. Although they do not have money for savings, income from family's production and her husband's modest salary are great enough to afford their daily life.

In the beginning of 2005, hearing that shrimp or crab breeding can create huge profit, Mrs Gam's family decided to quit planting rice. With a four-milliion debt (with interest of 5%/ month and 7-month period), they turned their 1.75-hectare padding field into shrimp-breeding pond. After the first harvest, realizing that profit gained from shrimp selling is just enough to invest into the next crop and pay off debts, they decided to switch to crab breeding.

Investment for crab breeding is greater than those for shrimp breeding. Bank of Agricultural and rural development provided her family with VND 15 million . Because of consecutive damages from hurricanes, diseases, a small number of crab are alive and the turnover is modest, Mrs Gam's family can not pay off the debt from the bank.

Currently, apart from the unpaid debt, her family has another hard-to-solve difficulty. They have no idea what to do next. If they keep aqua breeding and planting, they will not have enough money to reinvest. They have no capital in hand. They are unable to

afford high interest rate in unofficial market or ask for more debts from the bank (because of unpaid credit in the previous term). They can not come back to rice-planting as paddy-field was turned into alkalized ponds. It might take them a lot of time and finance to improve the paddy-field.

Division of coastal area into ponds and lakes, accidentally, turns benefits from coastal seafood from public ownership into private one. Since alluvial ground are already owned, Kim Son's residents are no longer free to catch fish in the area. It is also necessary to repeat that ponds and lakes are popular and profitable sources for the poor.

APPENDIX

Statistics of seafood products - Ninh Binh province (2001- 2005)

	2001	2002	2003	2004	2005
Ninh Binh province					
Area for fish-breeding (ha)	3 949	5 463	5 917	7 065	7 604
Salty water, brackish water	1 245	1 555	1 530	1 930	2 035
Output (tons)	441	1 398	1 679	1 953	2 349
Fresh water	2 704	3 908	4 386	5 135	5 569
Output (tons)	4 888	6 420	8 076	8 864	8 963
Kim Đong commune					
Seafood					
Area (ha)	n/a	54	191	320	403
Output (tons)	n/a	13	128	170	343
Trees					
Area (ha)	25	19	n/a	n/a	n/a
Yield (tons)	243	177	n/a	n/a	n/a
Rice					
Area (ha)	384	253	243	90	n/a
Output (tons)	922	633	656	243	n/a
Kim Sơn district					
Area for seafood production	n/a	n/a	2 615	2 715	2 867
Output (tons)	n/a	6 067	6 300	6 800	6 304
Area for sedge planting	n/a	306	511	60	n/a
Output (tons)	n/a	10 570	11 500	12 000	1 137

Appendix 2: Principal and additional livelihood projects

(concluded from group discussion results)

Livelihood project	**Estimated number of participants(%)**			**The poor**
	Kim Sơn district	**Kim Đông commune**	**NT Bình Minh**	
1. Fish breeding and planting	50	50	2	Seasonal labor (employment)
2. Exploitation of natural aqua products	35	2	-	x
3. Rice planting	90	-	80	x
4. Sedge planting		-	20	x
5. Cattle and poultry breeding	70	50	80	x
6. Business, services	5	3	15	
7. Craft industry	5-10	20	40	x
8. Employment in other localities	5-10	40	5	x

VIETNAM

ENGAGEMENT OF POOR FISHING COMMUNITIES IN THE IDENTIFICATION OF RESOURCE MANAGEMENT AND INVESTMENT NEEDS

CAN LOC DISTRICT, HA TINH PROVINCE

TABLE OF CONTENT Page

1. Survey in Can Loc district, Ha Tinh province:

- Survey was conducted on leading officers, staff of relevant specialized departments of the district and two communes Vuong Loc, Thinh Loc; each commune selected two groups including most fundamental members such as: man, woman, rich and poor people, old and young people, etc. Each group has about 10-12 people, but some groups have 26 participants due to people's interest. The total number of participants in discussion groups is 89 (excluding those separately interviewed).

- Survey contents consist of consultancy from the coastal poor community in order to find out difficulties faced income generation: discuss with Poor Resident Groups on capabilities of creating jobs in aquaculture based on experiences in Vietnam; discuss with local authority on such solutions as: establishment of sustainable aquaculture areas, environmental management capability strengthening, etc; making solutions of supporting poor fishermen in such fields as training, increasing skills, production means, credit, market and other production demands on the basis of sustainable development in combination with sex and nationality priorities; identify difficulties of poor fishermen in access to development resources and propose solutions to increase living standards in a sustainable way.

2. Introduction about Can Loc district, Ha Tinh province and 2 surveyed communes:

2.1.Can Loc district

- Area, population, natural conditions: Can Loc district is located in northern Ha Tinh province with total natural area of 37,816.89 hectares. Total population (as of 31 December 2004) is 181,400 (43,039 households). It is divided into 30 administrative units (commune, town) with 337 villages/hamlets.

- Natural conditions: Can Loc is located in tropical monsoon region, directly influenced by transitional climate between the North and the South. There are 2 clear seasons each year in Can Loc: dry season from March to August. In this season, sunshine intensively with high temperature of 36-37 degrees Celcius, strong West-South wind, low humidity (70%), little rain (rainfall only accounts for 10% of total rainfall of the whole year).

Rainy season often starts from September to February of the next year. In this season, it is rainy (especially from September to November), low temperature attached with East-North monsoon. Average temperature is about 25.5 degree C. Average rainfall each year is about 2,400 mm but unequally distributed, especially from August to October, it accounts for half of the whole yearly rainfall. Like the special terrain of the Central provinces, its terrain

inclines from west to east. West is high mountain, then gently sloping hill, small and narrow plain and Eastern coastal plain.

- Potentials and current economic development situation: National highway No. 1A goes through Can Loc area 11 kilometers length, 30 kilometers away from Vinh city to the North, 20 kilometers away from Ha Tinh town to the South. In general, the district is located in a rather favorable position in economic, science, technology, commodity exchange in the country and with foreign countries. The district's economy mainly relies upon agricultural production. Annual average income is always higher than previous year (average income is VND 1,781,000 /people (in 2000), VND 1,800,000 (in 2001), VND 2,400,000 (in 2002), VND 2,880,000 (in 2003), and it increased to VND 3,248,000 in 2004). Budget revenue grew from VND 13,052 million in 2000; VND 15,274 million in 2002; VND 17,370 million in 2003 to VND 19,881 million in 2004.

- Every year, more than 90% of people in working age have regular jobs, specific labour distribution is as follows: (see Table 1)

Table 1: Labour structure in Can Loc district, Ha Tinh province

Sector	**2000**	**2001**	**2002**	**2003**	**2004**
Agriculture	90.80%	90.72%	88.21%	86.91%	84.42%
Forestry	0.08%	0.11%	0.15%	0.17%	0.17%
Aquaculture	0.16%	0.17%	0.19%	0.20%	0.23%
Industry	1.77%	1.89%	2.07%	2.15%	2.41%
Trading and service	1.56%	1.63%	1.93%	2.04%	2.24%
Education and training	2.43%	2.54%	2.75%	2.79%	2.85%
Others	2.54%	2.54%	2.54%	2.54%	2.54%
Laborer in working age	96.20%	93.59%	93.09%	93.41%	94.79%

Source: Calculation from 2004 Statistics Yearbook of Can Loc district, Statistics Divsion of Can Loc district, 2005.

Rate of poor households tends to decline dramatically (from 34% in 2001, 27.98%-2002; 15.37%-2003 to 11.18% in 2004).

- Environment:

+ Coastal benefit source: Can Loc has a coastline of 12 kilometer long, fishing is done manually. Till now, it is one of the sea-water areas in which environment has not been badly affected (sea water as well as coastal areas have not been polluted).

+ Current situation of aquaculture environment: Until now, aquaculture in Can Loc district has not faced any big problem in environment in large scale. However, in recent years, there have been some fish diseases, including diseases caused by parasite and

bacterium, in some places and at some time. In order to limit and prevent fish disease, many people in Can Loc district think that it is necessary to have a separate water supply system for fish farming ponds, fish farming fields, to manage chemical usage in agriculture production according to proper technological process. Fish ponds must be improved and carefully treated before stocking. For centralized fish farming areas, it is necessary to gather waste water drainage from polluted ponds to treat centralized before dispose to the environment.

- Evaluate of current situation of fishery activities: Since 2000, fresh water aquaculture has become 'a movement' which is developed in large scale in Can Loc district. This activity has increased considerably in area; productivity and yield, creating more jobs opportunities, increasing income for people (see Table 2).

Table 2: Fishery activities in Can Loc district, Ha Tinh province

Criteria	**Unit**	**2000**	**2001**	**2002**	**2003**	**2004**
Aquaculture						
Area	Hectare	210	275	306	492	656
Yield	Ton	374.09	379.78	421.85	463.78	783.0
Number of households	Household	2581	2604	3066	3811	4725
Number of laborers	People	2048	2217	3207	4096	5264
Capture						
Yield	Ton	225.57	192.18	173.77	162.24	184
Number of households	Households	650	674	531	621	728
Number of labourers	People	753	793	751	936	880

Source: *2004 Statistics Yearbook of Can Loc district, Statistics Divsion of Can Loc district, 2005.*

Figures from Table 2 show that among fishery activities of Can Loc district, aquaculture is growing, if compare to 2004 figures with 2000 ones, we realize that farming area rose by 3.12 times, total farming yield is up by 2.1 time; number of laborers in aquaculture is up by 2.6 times. Fishing is in opposite direction while the number of laborers increased from 753 (in 2000) to 880 people, fishing yield decreased from 225.57 tones (in 2000) to 184 tones (in 2004).

Aquaculture in Can Loc district at the moment is mainly improved extensive farming, semi-intensive farming and increasing integrated and alternated farming. The most common aquaculture model in Can Loc district is now (1) 1 rice -1 fish; (2) 2 rice intercrop with fish; (3) 2 rice -1 fish; (4) Raise mature fish in ponds; (5) Nursing from fish fry to

fingerling (6) Nursing from hatchling to fingerling; (7) Nursing from fingerling to seed fish; (8) Growing fish in cages; (9) Growing fish in lakes, dams.

Main species of raised fish are traditional ones such as: mud carp (cá trôi), carp (cá chép), white ten bream (cá mè trắng) and grass carp (cá trắm cỏ). Those with high economic values such as monosex tilapia (cá rô phi đơn tính), white pomfred (cá chim trắng), cross-bred carp (cá chép lai), frog and trionychid turtle (ba ba) have just been farmed for a few recent years but not much (at the moment, many households want to be supported to farm these species).

2.2. *Vuong Loc commune*

Vuong Loc is located in a deeply sunken area. North borders Hong Linh town, South borders Nghen town, Khanh Loc commune, East borders Thien Loc commune, West borders Vinh Loc commune. Total natural area is 1,457.8 hectares, of which 663.6 hectares is agriculture land. Total population in 2005 is 8,093 people/1,960 households with 15 hamlets.

As for economy, agriculture represents more than 80%, average food per capita in 2005 is 732 kg/people/year.

For aquaculture and fishing: Total farming area is 58.5 hectares, of which 40 hectares of fish raising in lakes, 15 hectares of fish raising in fields, 3.5 hectares of fish farming in winter. The fishing yield in 2005 is estimated to reach 165 tonnes.

2.3. *Thinh Loc commune*

Thinh Loc is a coastal commune of Can Loc district with total natural area of 1,536 hectares, of which 476 hectares agriculture land, 564 hectares forestry land, 166 hectares of specialized land, 28 hectares of resident land, 315 hectares of rice growing land, 302 hectares of ponds, lakes, hills, fields, 140 hectares of peanut planting, the remaing area of planting other vegetables. The commune has coastline of the 12 kilometer long, beautiful beach and Chan Tien pagoda.

Total population of the commune in 2005 is 6,633 people (1,470 households), in which 351 households are rich and better-off (23.8%), 901 households are medium (61.4%), 218 households are poor (14.8%). The whole commune has 2,750 people in working age (41.5% of total population), in which 2,500 peole have stable jobs (representing 37.7% of total population, and 90.9% of total number of people in working age).

3. Some results through community analysis:

3.1. Income diversification:

Income source: Main income source of people in Can Loc in general and two surveyed communes in particular are from agricultural production. Apart from the main income source, they have additional and regular ones from aquaculture, capture, breeding cattle, poultry buffallo, cow, etc or from traditional medicine, working in other provinces, from people working abroad, transportation services, carpenter, mason, etc.

Other potential income sources: Can Loc district has total potential area of 3,782 hectares that is favorable for aquaculture development. There are 65 hectare small ponds, 287 hectare big lakes, 600 hectare rivers; 1,900 hectare hollow fields that are potential for fish raising. Of the total potential area, Only 559 hectares are now exploited (15%).

About 12 -15 (50%) communes are potential for centralized aquaculture planning. Most local people has experienced in this field. To make the best of idle laborers. New kinds of seed are more and more plentiful. The number of fishery staff is more and more increasing. Fish farming helps to prevent rice from insects. Self-providing seed on the spot are more and more enlarged. More households thoroughly dominated the market. Market information is more and more open. Fast transportation. The local authority support to build up dikes to prevent from flood and drought. The district currently prepares aquaculture planning. (Group of leaders and staff of line agencies of Can Loc district)

Assessment on aquaculture of Can Loc district
(by Group of leaders and staff of district line agencies)

Title	Advantages	Difficulties	Solutions/Recommendations
- Natural conditions Land Water - Laborers: 420,000 households. Their main income source is from aquaculture and capture.	- Easy farming - Make the best of idle laborers. - New kinds of seed are more and more plentiful. - The number of fishery staff is increasing. - More households thoroughly grasp the market. - Self-providing seed	- Outputs - Risks from natural conditions such as drought and flood. - Difficulties of seed providing source. Not satisfy needs of seed. - 706 hectares of freshwater and saltwater farming area. - Spontaneous but unplanned aquaculture. Not take the initiative of providing water. Fragmented aquaculture area. It is necessary to plan aquaculture area. - Diseases started to occur and not easy to prevent. Medicine services	- Need to ban absolutely fish catching by electricity - Need to mobilize many people to take part in production and protection. - Need to develop aquaculture model for the poor to learn.

	on the spot are more and more enlarged. - Market information is more and more open. - Fast transportation. - The local authority support to build dikes to prevent flood and drought.	providing for fishery field no available - Seeds are mainly bought in Nghe An province. - Many laborers but only a few of households having economic capacity could deploy this activity. - Dispersed aquaculture has an advantage of making the best of using area. However, its disadvantage is not easily strong development. Because consumption market will be more difficult if productivity increased. For example, green lobster and frog farming currently gains much profit but it is very difficult to consume if farming area is continued to expand. - Besides, fish farming could have advantage of preventing rice from inspects. - Only 80 hectares of brackish water area are now exploited. - The district has focused policy on aquaculture. Solidate aquaculture households with each other. - using electricity for capture still occur	

Findings in two communes showed that aquaculture is considered as the most potential income generation, improve livelihood of local community, because (1) Large farming area do not have enough water, produced not enough food; (2) Fishery capture is in short of capital; even if big ships for fishery capture are invested, it is not favorable because of coastline without anchorage, especially for refuge in case of storms; (3) Fish reserve for capture are decreasing, causing lower capture productivity; (4) Shortage of seeds suitable to

local land with high quality and productivity; (5) price of inputs for cropping is rather high while selling price of products is rather low, but potentials for aquaculture is rather great.

In Thinh Loc Commune: Key occupations of local people are agricultural production, fishery capture by hand-made tools, produce traditional medicine, jobs in other provinces, working abroad (conditions provided).

For aquaculture: In 2005, many households invested in aquaculture with scales as follows: 1.5 hectares of fishing ponds; 2 hectares of farming fish combined with rice growing; two models of frog raising see picture below). In general, aquaculture of households is developed well and generates high income.

For fishery capture: According to statistics, total capture volume of the commune in 2005 is 125 tones (1,200 million VND in value). Species of seafood captured by fishermen of Thinh Loc commune satisfy rather well market needs, with good consumption. It is an important condition for local fishermen to innovate capture tools towards "preservation of seafood benefit sources".

Summary on findings from discussion groups on livelihoods of the local people in Thinh Loc Commune

Contents of discussion	**Housing area, garden, pond** *(Livelihood 1)*	**Rice-field, sandy land** *(Livelihood 2)*	**Coast** *(Livelihood 3)*	**Sea** *(Livelihood 4)*
Activities of making money	- Normal gardens sweet potato, pea-nut, bean, fruit-tree; - Doing supplementary works (such as traditional medicine, husking rice, small businesses). - Livestock keeping, poultry, fish ponds	- Grow sweet potato, maize, pea-nut, and bean. - Aquaculture	- Only plant a few of casuarinas-trees; - not being used to do anything	- Fishery capture by ships, boats. - Exploitation of oyster, arca, snail, mussel, etc - Being inputs of fish sauce production
Level of life need satisfaction	Only as supplementary income source	***It is the main income source***	- Not making money for the community	- For most habitants, it is supplementary

	to satisfy about 10% of needs			income source; - For some fishing households, it is main income source.
Positive impacts/advantages	Centralized resident areas make favorable conditions in exchanging, learning production experiences, helping each other when facing difficulties in daily life.	- Production under general leadership; having conditions to diversify production - Potential for aquaculture development	- Create relaxing place for local people when it is too hot. - Lines of casuarinas-trees defend against storms, prevent from landslide erosion; sandy fields protect villages from dirty water.	- Due to long coast along 12-kilometer road of the commune, there are a great number of laborers taking part in on-sea economic activities. - Benefit source is rather plentiful with many kinds which could satisfy market demands
Negative impacts/difficulties	Conflicts in daily life; Polluted environment; easy diseases spreading	Half of the area is not irrigated; the in-field irrigation ditch system has not met needs of irrigation; low quality land.	Sands brought by winds, storms into farming land have bad impacts on planting and breeding.	- Due to coastal conditions, there is short of anchorage for big means of sea transport; - Potential risks of storms have great impacts on production and life of local people.

Vuong Loc commune is in remote area with agricultural production as local people's main income source. Its production value structure in 2005 is as follows: Agricuture (80,5%), Industry-Craft-Construction (4,8%), Commerce-Service (15,2%). Findings from discussion on livelihoods showed that:

Summary on findings from discussion groups on major livelihoods of local people in Vuong Loc Commune

Contents of discussion	***Livelihood 1***	***Livelihood 2***	***Livelihood 3***	***Livelihood 4***
Income generation	- Growing rice, maize, sweet	- Aquaculture - Combination	- Normal gardens of	- Supplementary

activities	potato, pea-nut, and bean. - Breeding cattle, poultry.	of rice growing and aquaculture.	sweet potato, pea-nut, bean, fruit-tree; - Fishing pond; Combination of duck raising and aquaculture.	trade (such as carpenter, mason, transporter, small businessman).
Level of life need satisfaction	***It is one of two major income sources***	***It is one of two major income sources***	An important supplementary income source	Temporary solution when unemployed
Advantages	- All households in the commune grow rice; - Most households raise buffalo and cow; - Approximately 20-30% of households have effective aquaculture.	- Fishery products have high economic value and great market needs; - Development potential of the commune is rather big; - Local people have had some basic experiences.	- Take the best of kinds of laborers (one could do any time and everyone can do); - Diversify the scales (from making-the-best farming to large scale investment), it is suitable for poor people.	- Local people have very high demand on doing these works; - Wages of these works is often higher than breeding and planting works; - Create jobs for idle laborers (including abundant laborers and farmers in leisure time).
Difficulties	Harsh climate, diseases, insects, high price of inputs, shortage of high-quality and productivity seeds and suitable to local land, unstable selling price of planting and breeding products.	Shortage of capital, knowledge on technical technology; fish diseases, bird flu; protection is rather difficult and costly if self-organization and decentralization.	- Potential risks of big explosion and spreading of diseases (because many species live together in the same narrow area). - Not taking the advantage of irrigation, etc	- Labourers without professional and skills couldn't compete with skillful laborers.
Recommendations for each type of livelihood	- Survey on suitable new seeds; - Find out	- Organize training courses on capacity strengthening.	- Plan to reduce population density for households	- Create suitable supplementary trade;

	solutions of stability and low price of fertilizer, pesticide, etc	- Establish suitable models to conditions of the commune. - Making specific plan of aquaculture.	(with various generations living together in a house) and have demand to separate	
General recommendations	- The Goverment should invest more in construction of irrigation works for agricultural production. - The Goverment should have policy that allows people to change land use purpose and call for tender of uncultivated land. - The district should establish units to ensure the stable, quality varieties supply to farmers (including cattle breed, poultry breed, and fish breed). - The Government supports information about markets of agricultural products and diseases prevention for farmers to minimize risks in agricultural production. .			

Some difficulties in income generation for community: Findings from group discussion reflected current potentials of income generation but most local people, especially poor households are short of capital, technical knowledge , capacity to prevent natural calamity, protect water source, etc.

3.2. Market and its impacts on diversification of community income:

Concerning selection of production scale for any product, most participants in group discussion or interviewees claimed that it was really difficult to produce one agricultural or fishery product, but it was far more difficult to reach buyers and markets. This problem has actually occured in Can Loc for one or two years now. Officials and people have made great efforts in introducing and successfully raised some fishery species of high economic values such as green lobster, frog, tortoise... However, local people cannot afford these kinds of products whereas total output is not enough for export. Consequently, farmers have to sell for restaurants with low efficiency. Local people called the problem “too much for consumption, too little for export”. Furthermore, unit price largely depend on fluctuation of input costs. Market, therefore, always plays a crucial role in production determination and business outcome in general and farmers’ income in particular.

Regarding fishery market in Can Loc, Ha Tinh, statistics provided by SUFA, Ha Tinh reveals that people’s annual demand for fresh water fish is 9.6kg/head on average. As for Can Loc, if we divide total output of 783 tonnes in 2004 by total population of 181,400 people, average figure is 4.3kg/person/year (satisfy only 45% of the district’s demand). Also, Can Loc is situated in High way 1, an important transport axis and near consumption centers with convenient transaction condition. Therefore, potential of fishery market is very high, not to

mention current increasing demands for tilapia and other fish of high economic value for export. Can Loc district itself considers this a good opportunity to develop and expand aquaculture scale.

3.3. Possibility of job creation in aquaculture from experiences in Can Loc in particular and Ha Tinh in general:

- According to statistics of Can Loc district in 2004, one hectare of fish farming may create over 8 regular jobs on average. Hence, with a potential area of 3,782ha, if investment provided, can attract 30,256 laborers on regular basis, accounting for over 35% of total people in labour age.
- In opinions of fishermen in Thinh Loc commune, Can Loc district, investment rate of VND 15-20 million in fishing can generate a regular job with monthly average income of VND 1.2-1.7 million (after deduct all kinds of expenses and depreciation).

3.4. Comparison of inland fish farming and coastal aquaculture:

3.4.1. Investment rate: Minimum investment in coastal aquaculture is normally higher than that for the same activities inland. For example, funding for a good fishing boat greatly outweighs that of an aquaculture pond.

3.4.2. Income rate of aquaculture is currently higher than that of fishing

3.4.3. Inland aquaculture suffers less from natural calamities such as storm or flood but more from diseases.

3.4.4. Fishing requires strong and trained labor, mainly men, whereas most people can participate in fish raising. Therefore, same investment scale in aquaculture generates more jobs than in fishing.

3.4.5. Investment in aquaculture may support the poor better than exploitation.

3.4.6. Present potentials for aquaculture development remain large and promising while aqua reserve is going to exhauste.

3.5. Supports to the poor from organizations in fishery development (catching, aquaculture, processing,...):

Main features of the poor in Can Loc are: (1) Aquaculture pattern: only do fish farming in pond or field; (2) Social-economic features: lack of capacity management (no production plan), short of fund, almost no cattle raising, lots of children; (3) Child nutrition and health: not good; (4) Education: lack of adequate concerns, most people just completed primary schools; (5) Labor and employment; have to do paid work, and jobless after harvest time; (6)

Gender issue: Both woman and man lack of technique, women are too busy looking after children.

In implementation of mutual support movement, organizations in Vuong Loc commune have collected money and rice to assist difficult families with total sum of VND 1,700,000, 98kg of rice, 35kg of seed rice, and 4 breeding pigs. They also contributed to build 3 grace houses and construct clean water and sanitation works with total value of VND 8,771,000 .

> *Organizations have arranged many propaganda campaigns for the poor to raise their knowledge and awareness. Though the poor have few chances to access society, the locality has via several projects organized vocational trainings in production and husbandry... in order to help them to be more confident to improve livelihood. The poor are in urgent need of social support, particularly strategy and motivation for them to produce and do business themselves. Besides, Farmer Union should assign its branches to directly support poor households with knowledge if necessary as well as other means for them to improve life. (Group of officials in Vuong Loc commune)*

In 2005, Thinh Loc commune helped 12 households to escape poverty (equal to 5.2%). In term of aquaculture, organizations and community have facilitated and given priority to poor households in borrowing funds for production development and farming techniques, and seed in certain cases.

Solutions by the locality: Currently, most communes have applied several measures to encourage people to develop aquaculture and created favorably legal conditions to establish sustainable aquaculture zones and enhance environment management capacity. To implement these guidelines, many households, namely Lien's, Muoi's, Lan's and others in Vuong Loc have exchanged fields to each other to expand aquaculture area to larger scale.

3.6. The poor access to fishery benefits:

Aquaculture, exploitation, service, and processing are actually diversified in terms of employment, investment volume, and technical requirements, thus consideration are needed to find the best for the poor to access.

Typical aquaculture pattern in Thinh Loc commune

There are 8 people in the family of Mr. Le Doan Due, 46 years old and Mrs. Nguyen Thi Nhu, 42 years old, in hamlet 4 Quang Trung, Thinh Loc commune, Can Loc district, Ha Tinh. Their family used to be a poor one, for three years now they have invested in fish farming, which helped them not only escape poverty but also become better-off. Many people mentioned this case as a typical pattern of business households. Mr. Due made a pond of 500m^2 in their own garden for integrated production. They invest in food for cow and pig, and use waste of cow and pig to raise frog and fish. Below is our discussion:

- In the current context of Thinh Loc commune, which career do you think may help people become better-off?

- Only aquaculture.

- Which species to be exact?

- Frog may bring about high efficiency as the crop takes only 2.5-3 months, a stable market provided, we can get net profit of 5 million if we invested 10 million.

- What problems do you often face in aquaculture?

- Funding. Little fund results in small scale and total output is not enough for wholesale, so you often lose. However, I find myself lack of advanced technique and there is not sample pattern for us to draw experiences.

- If given a chance, can you expand production scale?

- I can definitely expand scale if I have more money.

- How much do you need to develop?

- About VND100 million .

- Can many people in the hamlet promote like you?

- Yes, many, particularly those having good conditions available..

4. Recommendation:

4.1. Basic factors contributed to community income diversification:

* Aquaculture development is one of various income generation activities for community at large scale as almost all eco-regions of Can Loc district have potentials of fish farming,

particularly: (1) In Nghen riverside area people can do fish farming in field, pond and pen in lake with traditional fish, then they can raise other kinds for export with high volume such as acclimated tilapia, green lobster,... (2) In a half-mountain half-plain area: people can raise traditional fish in field, pond or reservoir. Seed and fish can be raised on bamboo cages or reservoirs. (3) Middle area: Traditional fish farming in field or pond; Can raise high value kinds of frog or tortoise...

* Combine aquaculture and exploitation and processing to diversify product items.

* Expand fishery services in association with various commercial activities.

* Organize tourism activities based on coastal area advantages

* Afforestation in coastal areas for protection as well as to increase people's income.

4.2. Major factors to diversify income for the poor:

* Only supported by community can the poor access stable income generation, including supports from the better-off and counterparts. According to officials of Vuong Loc commune, one solution for the poor is to establish volunteer networks in certain trade. They themselves together organize a network and set their own regulations to support each other.

Funding for the poor should be taken into thorough consideration. If the fund is too big, repayment may be difficult, even with unsatisfactory efficiency. A sufficient fund can on one hand make investor feel secure, and on the other hand facilitate the poor to improve income and escape poverty. However, there should be supervision mechanism so that the poor make efforts in production as well. In aquaculture projects, the poor can be divided in groups composing rich households, medium and poor ones as well. Initial bases should be covered by commune or district so that the poor are given positive supports in farming and husbandry. (official group of Vuong Loc commune)

4.3. Demand selection

Set priority in demands for aquaculture development in Can Loc

Demand	**Can Loc district**	**Vuong Loc commune**	**Thinh Loc commune**
Planning and implement aquaculture plan	**1**	**1**	**3**
Establish good patterns in line with local context	**4**	**3**	**5**
Invest in infrastructure for water supply and drainage	**2**	**2**	**2**
Grant loans appropriate with specific development scales	**3**	**1**	**1**
Provide regular technical expertise at grassroots levels	**6**	**4**	**6**
Organize trainings to improve aquaculture capacity for farmers	**5**	**6**	**4**

4.4. Partner selection for investment project:

4.4.1. Can Loc district's People Committee follows State management: Decision to receive project; Determination of regional planning project; Implementation of State management of investment project; Provision of technical services, seeds as well as in market and environment.

4.4.2. Center for the poor development in Can Loc district, Ha Tinh is selected to be consultation partner to prepare prefeasibility project, arrange implementation, directly manage and supervise implementation process.

4.4.3. People Committee and line agencies in communes within the project area are responsible for detail implementation of project in community.

4.4.4. Project implementation pattern is designed for households or groups of households.

5. Noticeable issues in investment projects formulation on fishery benefits protection:

5.1. Freshwater aquaculture development is one of activities directly affect mitigation pressure on coastal fishery benefits.

5.2 In addition to central projects with a wide range of products for export, it is essential to establish a pattern of production to serve local markets in longer period.

5.3. Investment should neither be too broad in many areas which limits the scale nor inconsistent funding. Training should be in combination with piloting and implementation. Investment should be focused on a close process to develop good pilot that can be reapplied.

5.4. Concerning the poor: Besides direct forms of support, assistance via community may be introduced to help them escape poverty in a sustainable manner.

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VIETNAM

ENGAGEMENT OF POOR FISHING COMMUNITIES IN THE IDENTIFICATION OF RESOURCE MANAGEMENT AND INVESTMENT NEEDS

THACH HA DISTRICT, HA TINH PROVINCE

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I. SOCIO-ECONOMIC, ENVIRONMENTAL CONDITIONS AND FISHERSY RESOURCES OF HA TINH PROVINCE

1. Ha Tinh province

Ha Tinh province is situated from 17°53'36" - 18°46'24" North and 105°10'48" - 106°29'30" East, share border with Nghe An province in the North, Quang Binh province in the South, Laos DPR in the West and Tonkin Gulf and China Sea in the East.

Total province's area is approximately 605,574 ha, accounting for 1.825% of total inland area of Vietnam. Agricultural land 96,804 ha, forest land accounts for 207,888 ha, special-use land 37,160 ha, residential land 6,823.55 ha and bare land or unused land 256,895.80 ha.

Ha Tinh province includes 8 districts and 2 towns. Two districts (Huong Son and Huong Khe) and Hong Linh town are in mountainous areas, Duc Tho district have both hilly and flat area, and remain districts (Thach Ha, Nghi Xuan, Can Loc, Cam Xuyen and Ky Anh) are coastal, flat land, hilly and mountainous areas. Mountainous areas accounts for 79.25% of total province's area. Natural resources of the province are very diverse. The province has two natural protected areas namely Ke Go and Vu Quang.

Climate of Ha Tinh province is a typical monsoon tropical climate which is characterized by a fairly long dry season with hot and dry winds blowing from Laos DPR and a fairly long rainy season with rains, storms and floods. Followed by rainy times in an interval of two seasons is cold time. Storms occur every year. In all three seasons, there are floods that result in serious crop loss

Ecological and agricultural areas

Ha Tinh has 4 key ecological and agricultural areas, each area has its own typical geographical, cropping pattern and socio-economic features.

Hilly region

Hilly area is an intermediary area between a flat area and a moderate steep mountainous area, 30,036.47 ha (4.96% of total province's area). Hilly area is a potential area for development of cropping, husbandry, agriculture and forestry. Key crops here are potatoes and sweet potatoes, cassava, soybean and maize. Fruit trees are increasingly grew in this area (e.g. orange, grapefruit, mandarin orange, custard apple, etc.)

Mountainous region

Most the mountainous region is situated in the Western part of the province with an area of approximately 479,977 ha (or 79.25% of total province's area). There are the Rao Co mountain range with highest peak of 2,235 m in Huong Khe district and other mountain ranges with altitude ranging from 1,290 – 1,407 m. Arable soil layer here is very thin and poor. There are only 45,691.93 ha (9.51%) of mountainous area that can be used for agricultural purposes. So far this area has not yet been accessible by roads. However, path

access are available and forest is exhaustedly exploited.

Flat area

This area is situated in between coastal area and hilly area, stretching from valleys and alongside river's banks, accounts for approximately 54,259.43 ha (8.95% of total province's area). This is considered as a key rice basket area of the province, in which two rice crops per year can be cultivated in Most its area. Population populate densily. Rice productivity may be high, especially where two crops per year can be cultivated. But in some areas, due to lack of irrigation works, it is impossible to cultvate two rice crops per year like other parts of the region.

Sandry coastal strip of land

Ha Tinh's coastal line is 137 km long and its water areas are 41,300.15 ha (accounts for 6.81% of total province's area). Arable land is often saline. There are 4 big river mouths that create wetland potential for aquaculture and convenient water ways, particulalry Vung Ang (in Ky Anh), where a big sea port can be built.

Infrastructural settings

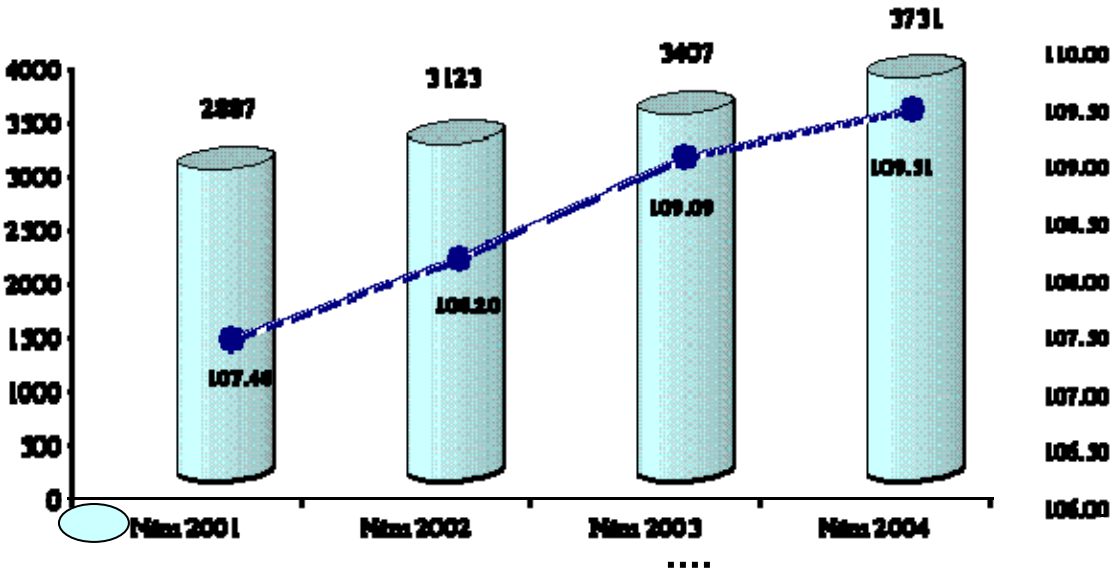
Irrigation system is degraded, particularly Linh Cam water pumping station and irrigation channels of of this system and Ke Go water reservoir. Existing irriagation system is unable to to provide enough water for agricultural production. Due to a poor and degraded irrigation sytem many areas in Ha Tinh suffer drought and have no possibility for 2 cropping patterns. Coastal areas of Nghi Xuan, Can Loc, Thach Ha districts are saline and lack of fresh water not only for cultivation but also for livestock.

During the period of 1996- 2004, Ha Tinh had mobilized a significant investment for development of socio-economic infrastructural. The province invested in expanding transport systems, sea ports, and industrial zones. So far infrastructure of Ha Tinh is considered relatively better than that of other provinces. However, in order to respond to development demands for coming time, current infrastructure is still short in terms of quantity and insynchornic.

Economic development situation

Figure 1: PROVINCE'S GDP

(At current price)



Absolute figures (Billions VND) Development indicators (%)

Table 1: TOTAL GDP BREAKDOWN BY ECONOMIC SECTORS (At a comparative price)

Unit: Millions VND

		Break down in					
		Agriculture, forestry		**Industry**			
	Total	Fishery		Construction		**Services**	
		Central	Provincial	**Central**	Provincial	**Central**	Provincial
2000	*2685764*	-	*1347105*	*51742*	*256843*	*148029*	*882045*
2001	*2886731*	-	*1415932*	*55926*	*285543.0*	*142345*	*986985*
2002	*3123411*	-	*1476707*	*55718*	*351593*	*142332*	*1097061*
2003	*3407326*	-	*1554802*	*71131*	*465946*	*158063*	*1157384*
2004	*3731268*	-	*1633529*	*96569*	*569377*	*170708*	*1261085*
		Development indicators (Preceding year = 100)- %					
2000	*106.22*	-	*107.66*	*82.13*	*114.56*	*95.04*	*105.68*
2001	*107.48*	-	*105.11*	*108.09*	*111.17*	*96.16*	*111.90*
2002	*108.20*	-	*104.29*	*99.63*	*123.13*	*99.99*	*111.15*
2003	*109.09*	-	*105.29*	*127.66*	*132.52*	*111.05*	*105.50*
2004	*109.51*	-	*105.06*	*135.76*	*122.20*	*108.00*	*108.96*

Table 2. Proportions of agriculture, forestry and fishery value (%)

	1996	2000	2004
whole sector	**100**	**100**	**100**
Agriculture	82.1	84.7	81.98
Forestry	9.4	6.8	7.14
Fishery	**8.5**	**8.5**	**10.88**

Sources: *Ha Tinh province statistic data*

In recent years, agricultural sub-sector is a key player, contributed to stabilize livelihoods of the province. In 2004, agricultural sub-sector contributed 5,233 billions VND to GDP of province, accounts for 45.9%. In the period of 2001-2004, crop productivity had increased rapidly to more than 10% per crop and an increase in crop and plantation productivity accounts for 63% of total agriculture.

Livestock husbandry is an important income source, in 2004, it accounted to 33.25% of total production values of whole agriculture sector – that is a relatively high proportion compared with other provinces in the country. However, husbandry productivity is still low because of diseases, poor quality strains, and lack of capitals. In recent times, some districts of Ha Tinh are encouraged to raise hybrid Sind bulls and pigs for meat due to high economic values.

At present, the province does not have smoketack industry. Industry and handicraft industry are very small and still at early stage of development. There are some small-scaled agricultural and fishery processing units. However, it is difficult for them to improve and upgrade their production due to lack of capitals. In 2004, there are 12,037 industrial production units that are employing 3.9% of total work force in different economic sectors of the province. According to orientations and objectivies for development, it is planned that the province is going to exploit a metal mine in Thach Khe and establish a metallurgy complex there.

Province's trading centers are being formed and rural markets are relatively developed satisfying needs for goods exchange of local people. In 2004, total labourers working in trading and services industries accounts for 5.56% of total labour force in other industries of Ha Tinh.

Assessment on poverty situation

Ha Tinh has 262 communes, 37 of which are poor communes and 23 others are extremely poor. Until now, poverty reduction has achieved significant results, many poverty reduction measures have been implemented and yielding good results. Poor people's living standards have been improved.

In addition to benifit from National Target Program for Poverty Reduction and Job Creation of the Government, the province has benefits from other international -funded projects to support a comprehensive socio-economic development in rural areas, creating great change in quality of life of Ha Tinh people. In the past 5 years, the province has generate more than 142,000 jobs for labourers. Poverty rate has reduced significantly, from 28.8% in 2000, to 10% in 2004 (according to old poverty standards). However, according to new poverty standards, poverty rate of Ha Tinh remains high, approximately 30%, as high as that of

Northern Central region. Therefore, poverty reduction is still one of the most important goals of the province in coming time.

Capture fishery and aquaculture

Ha Tinh can exploit a 137km-long coastal line with more than 20 small and big rivers running into the sea through 4 river mouths can be used for aquaculture and plantation of mangrove forest. This area has 18,337 ha, of which 6.850 ha are brackish and fresh water surface (brackish water surface is 2,850 ha and and fresh water surface is 4,000ha) are used for aquaculture, mainly shrimp and crab raising. Total shirmp raising areas are 2,650 ha with total output of 2,330 tones in 2005. Most of these areas belong to districts of Ky Anh, Cam Xuyen, Thach Ha, Can Loc and Nghi Xuan. Aquaculture has been developing in recent years (since 1992) thank to credit support programs. Coastal areas have approximately 1,243 ha with potentials for intensive shrimp raising. Productivity of intensive shrimp raising can reach at 60-200 kg per ha per year.

In 2005, total labors involved in production and business operations of fishery sector are 44,000 people, labors involved in capture fishery are 12,000 people, in aquaculture: 24.500 people, in fishery processing: 5,400 people, and in boat repair services: 2,100 people.

According to Department of Fisheries of Ha Tinh province, **t**he province's natural resources for sustainable aquaculture development are as follows:

- Sea waters have various kinds of fisheries (According to figures of Institute of Seafood Studies: there are 60 kinds and 20 kinds of high-economic value fish and shrimp respectively in Ha Tinh's sea waters);
- Large area for aquaculture (23,000 ha), abundant supply of labours, convenient or easily-accessible transportation network, and support from local and provincial authorities through resolutions for fishery development and promotion (Directive No. 04 CT/UB issued by Provincial People Committee on promotion and intensification of economic transformation and aquaculture development dated 14th March, 2005; Decision No. 633 QD/UB- NL2 on approval of a Program for Protection and Development of aquatic resources of Ha Tinh province until 2010 dated 8th April, 2005; Decision No. 77/2005/QD-UBND dated 7th September, 2005 promulgating on some support policies for aquaculture development for the period of 2005-2010) are important basis for protection and exploitation of aquatic resources and livelihood improvement for local people.
- Beside, people have been practicing capture fishery industry for many generations and markets for aquatic products are relatively stable. A movement for promotion of fresh water fish raising has been growing strongly in some localities like Duc Tho, Can Loc, Nghi Xuan, and Hong Linh town. In 2005, areas for brackish aquaculture were 2,850 ha, 2 times higher than that in 2001, areas for fresh water fish raising were

3,300 ha, increasing 1,100 ha. Especially a combined fish raising: fish raising and rice cultivation, or fish and duck raising are being practiced widely. Some fishery extension models have proven effective, contributing to promotion and wider application of production models like mono-sexual tilapia or intensive shrimp raising (an industrial, intensive shrimp raising area in Ky Nam has been invested with tens billion dong and located in an area of 85 ha. So far 12 ha of this work has been put into operation since 2004 and producing good results), turtle, frog, common tiger prawn, etc.

However, **aquaculture and capture fishery is facing with some big difficulties as follows:**

- Great weather fluctuation (sudden sunshine, rain, or flood, etc.);
- Because people have low educational background and are still very poor, they do not have enough investments in boats or ships for capture fishery or aquaculture either;
- Capture fishery is still fragmented. Total machined boats with capacity of less than 20 CV (horse power) still remain about 90%; Values of products of capture fishery are not high. Offshore capture fishery program is not carried out and managed effectively (at present Ha Tinh has 15 poorly-equipped offshore capture fishery fleets such as lacking of fish-searching equipment and facilities to seek for new fishing grounds, etc.). Most fish-catching forces of the province are exploiting fish in inshore, shallow waters and using some environmentally or ecologically-harmful methods (e.g. using mines, electrical gears, or heavy light, etc.) that is a worrisome issue of competent authorities involved in protection of aquatic resources.
- Infrastructure of aquaculture areas is still underdeveloped; disease control system and facilities and expenses for disease prevention are very limited. Some shrimp raising areas have low effectiveness because outbreak of disease of shrimp always happens.
- Production and services supply system for fresh and salt water fishery strains is considered weak because it can satisfy 30-40% of the province's demands only, particularly; supply of common tiger pawn strains is suffering some difficulties.
- Though it is considered as an important economic sector of the province, in which aquaculture is considered as a breakthrough, the province had had aquaculture extension policies, in fact the province's budget to support for this sector is very limited, far from enough to assist and promote a very weak sector. Therefore, Department of Fisheries proposes following solutions: provide preferential credits for poor households, improve capacity for fisher folks, develop investment projects for infrastructure, issue policies to stimulate production and establishment of cooperatives or production units, and construction of fish markets and sea ports for fishing boats and ships to shelter from storms, and develop some pilot models for experience exchange and learning among people.

Figure 2: AQUACULTURAL OUTPUT

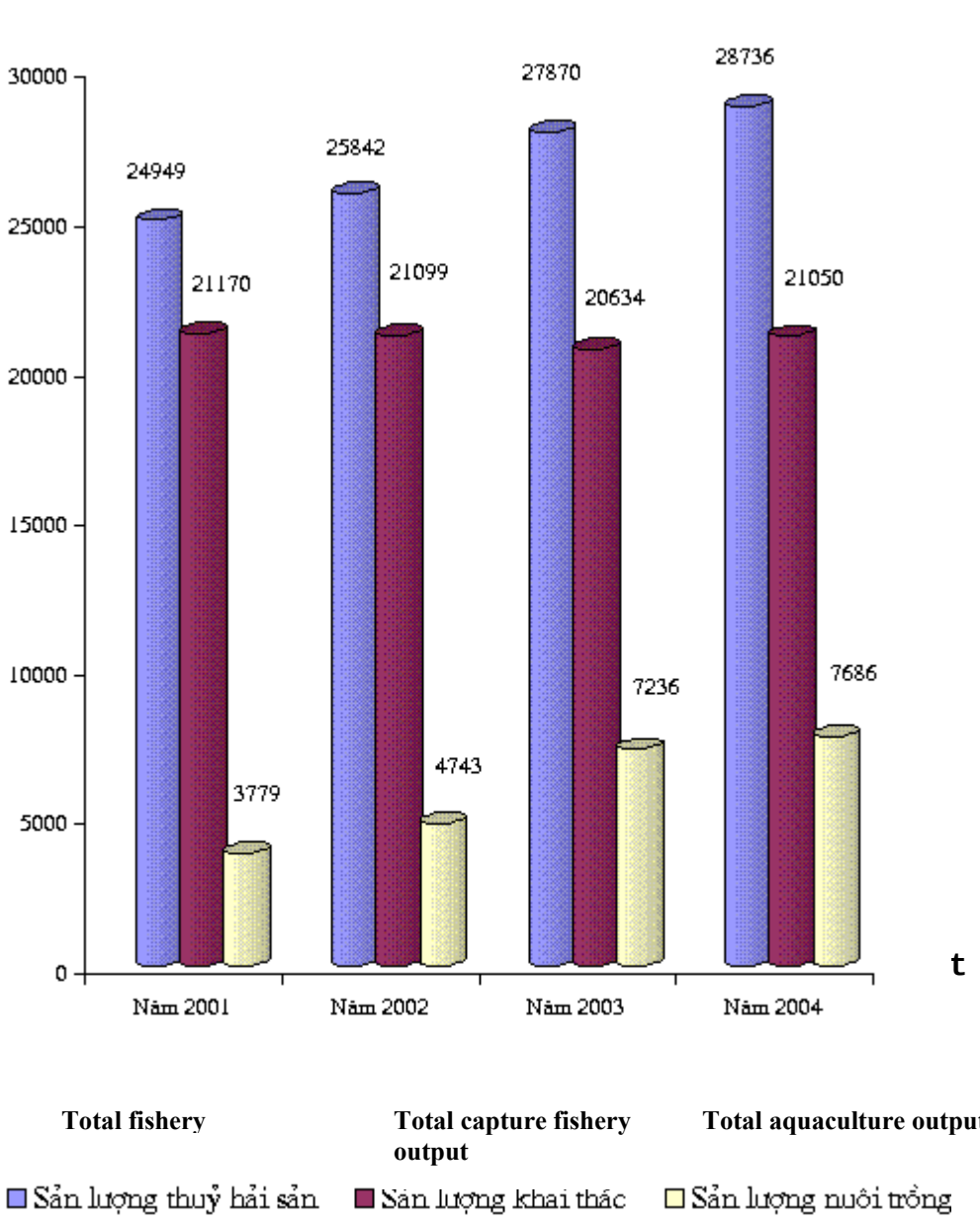


Table 3: AQUACULTURAL OUTPUT BREAK DOWN BY DISTRICT

Unit: Tone

	2000	2001	2002	2003	2004
Total	23899	24949	25842	27870	28736
Categorized by economic sectors					
Domestic economic sectors	23899	24949	25842	27870	28736
State-owned	20	38	24	25	15
Collective-owned	2244	4225	5028	4712	3732
Private-owned	225	1053	1552	1505	1635
Household-owned	21410	19633	19238	21628	23354
Foreign-invested economic sector	-	-	-	-	-
Categorized by districts and towns	23899	24949	25842	27870	28736
Town of Ha Tinh	60	75	91	128	295
Town of Hong Linh	29	20	36	83	95
District of Huong Son	260	316	297	474	495
Duc Tho	651	677	986	1210	1380
Vu Quang	106	180	127	118	129
Nghi Xuan	7008	7603	7821	7827	7051
Can Loc	590	592	595	617	967
Huong Khe	336	341	328	358	352
Thach Ha	5965	6042	6224	7166	6805
Cam Xuyen	4299	4434	4677	5315	6081
Ky Anh	4595	4669	4660	4574	5086

Source: Statistic Year Book of Ha Tinh province in 2005

2. Thach Ha District

Thach Ha district is situated at the centre of Ha Tinh province, borders districts of Can Loc, Cam Xuyen and Huong Khe. Across the district are roads such as National Highway No.1A, provincial roads like 15A, 2, 3... and waterways routes like Nghen river, Giam river and Do Diem river. Some ports are located in the district, namely Cua Sot port, Ho Do port, etc.

Terrain of the district is classified into three separate regions: mountainous area in the South West, delta in the district centre at average altitude of 5m above the sea level, and coastal area including communes of Thach Hai, Thach Van, Thach Kim, Thach Tri and Thach Ban.

Thach Ha is situated in monsoon tropical region with an annual average rainfall of 2,500mm, an average temperature of $23^{O}C$, and annual average humidity of over 80%. hydrographical system of the district is influenced by rivers like Do Diem river, Cua Sot river, Nghen river and Cay river with a total valley area of 800 square km. At present, water sources for irrigation and daily life of people are mainly from Ke Go Lake and rain-water. Underground water source in the district is rather large in reserve but depth of this source is shallow and affected by alum.

Mineral resources in the district include Thach Khe iron-mine with a 540-ton reserve, and Emenit mine in Thach Hoi and Thach Ban.

Thach Ha has a coast of 27km and Cua Sot – one of the 4 largest fishing grounds in Ha Tinh province. Annual capture yield is from 3,500 to 4,000 tons. Area for salt production in the district is about 350 ha with an annual output of 2,200-2,500 tons. In the district, coastal area of Thach Hai has great tourism potential.

Total population of Thach Ha district is over 18,000 people. There are 37 communes including five mountainous communes in program 135 of the government and 16 coastal communes (of which 6-7 communes are specialized in fish raising).

Total area in the district is 38,894.54ha, in which area for aquaculture is 998.46ha, area of used rivers, streams and water surface is 3889.25ha, and unused flat area is 3,683.53ha (this is an important resource exploitable and useable for development of aquaculture or other industries in the district). Area for agriculture is 1,410ha, in which areas of brackish water and fresh water are about 910ha and 500ha correspondingly (in 2005 only shrimp breeding area of about 453ha). Area for aquaculture has been double due to shifting from rice cultivation to aquaculture and about 200ha of cultivable land has been transformed to land for aquaculture. In the next 5-6 years, it is planned to use another 1000ha of uncultivable land for aquaculture production.

Aquaculture economics development in the district

- *Capture fishery:* yield in 2005 was 4,500 tons including 450 tons of cuttle-fish, 50 tons of shrimps, 800 tons of fish for export and 3,200 tons of fish of all kinds. Communes with large yield of aquatic products are Thach Kim, Thach Hai, Thach Bang, Thach Long, Thach Lac; total number of boats is 720 with a total capacity of 13,600CV. Logistic services for capture fishery have been developed: some boat and ship building establishments have been started, fishing equipment providers and ice making plants have been in operation; Cua Sot fish port is being built in an area of 3ha with an investment budget of VND 33 billion.
- *Fishery processing*: processed products in 2005 included 300 tons of fresh and dried cluttle-fish, 250 tons of shrimps, 500 tons of salty paste, 500 tons of salted fish and 400 tons of dried products of all kinds. Processing of aquatic products mainly carried out according to traditional methods to serve domestic market. Besides, in the district there is Do Diem aquatic product export - import enterprise (Thach Son) and three private processing businesses in Thach Kim, Thach Bang…
- *Aquaculture:* Aquaculture has taken advantage and well exploited uncultivated water surface, changed some low productivity salt-marsh and rice farms to aquaculture area. Mollusc breeding, especially oyster and mussel breeding, has been developed, generating a significant income source for coastal fisherfolks with an annual productivity of 10-20 tons/ha and a total yield of thousands of tons, satisfying domestic consumption and export to China and Laos… Fresh water aquaculture has achieved some significant changes: in the past fish was bred in traditional ways in which popular kinds of fish such as black carps, carps, mud carps, and tench breams… were kept in ponds, swamps and lakes to make the best of water surface. Since 2003 model of fish raising and rice cultivation combination to improve production efficiency in an area has been welcomed by many farmers, so that 150ha of rice fields has been used to develop fish production and other goods. In 2005, total area of aquaculture in the district was 1,210ha (excluding 200ha for industrial shrimp breeding of Viet My company in Thach Tri commune), including:

  + Brackish water aquaculture: 701ha (570ha for common tiger prawn and crab breeding, 140ha for mollusk breeding)

  + Fresh water aquaculture: 350ha

  + Combined fish raising and rice cultivation models: 150ha

  + Total output of aquaculture and domestic exploitation is 2,500 tons

+ Area for semi-intensive and intensive fish farming is 100ha; the rest is for extensive farming.

Up to now the district's fishery sector has created 10,200 jobs with 4,500 in capture fishery, 1,200 in fishery processing, 2,000 in aquaculture and the rest number in aquaculture services

Economic development situations in Thach Ha district

Even though Thanh Ha is located close to a town, its economic development is at an average level (below a half) of Ha Tinh province. Poverty rate of the district is 39.2% (according to new poverty standard). District economic structure is agriculture led. Agriculture, forestry and fishery contribute 75% GDP of the district while industry, handicraft industry and construction account for 20% and services take 5%.

Ranking from top down of district income generating industries is as follows:

1. Agricultural production (cultivation and livestock husbandry)
2. Aquatic products (capture fishery, aquaculture and fishery processing)
3. Services for small scale industries
4. Afforestation and forestry product exploitation
5. Labour export, ore exploitation and other industries
6. Salt production

In terms of two key livelihoods that create most incomes for the district as agricultural and aquatic production, the district has met with following difficulties:

- **Difficulties in agricultural production**
  - market
  - weather
  - Material inputs (high price of fertilizer and agricultural material inputs)
  - Weak infrastructure (inner-field roads)
  - Inequitably intellectual standards of people, lack of science and technology knowledge and lack of market information
  - short of capital
  - Impoverished soil and sophisticated topography
  - Small scale production practices remained

- **Difficulties in aquaculture**
  - Aquatic resources is becoming exhausted
  - Ponds and lakes have not been planned synchronically
  - Lack of capital, aquaculture is totally funded by state budget and mainly for operations of staff apparatus. Purchasing of boats and rafts and construction of aquaculture infrastructure are entirely paid by people (except offshore fishing program that is inefficient).
  - Sources of seeds and breeds are not available in the district (they are bought from other provinces such as Hue, Da Nang, etc…)
  - Backward capture techniques and facilities with majority of 18CV boats; undiversified sources of fish, capture is mainly based on floating fish and fish deep in the water have not been exploited.
  - In short of science and technology knowledge on aquaculture
  - Processing is mainly by hand
  - Diseases
  - Natural disasters
  - People's attitudes towards environment and fishing ground protection are limited (mine and electrical gear are still used for fishing)
  - Processing technology is unavailable
  - Weak saline prevention dykes
  - Unstable output markets
  - Anchorages for capture fishery are unavailable (to shelter from storms)

Besides, the district has many advantages for production activities that increase incomes as follows:

- Plentiful labor forces
- Industrial plants have been developed
- Convenient transportation (roads and waterways, except inner region transportation system)
- Having orientations for planning of crops and livestock until 2010

- Having potential water surface areas for aquaculture
- Diversified and rich fishing ground
- Aquaculture has been determined as a core sector
- Strong and stable political system
- Bays and fish ports are under construction.

By current time, Thach Ha has enjoyed available supports as follows:

- Irrigation system have been constructed by 50-60%
- Models for cultivation and livestock husbandry established by development programs such as IFAD, Belgium OXFAM, etc... are available
- Rural markets have been invested and constructed
- Cross-breeding with Sind bulls
- Aquaculture support systems are available
- Offshore fishing is funded by state budget but inefficient.

At present, hunger elimination and poverty reduction strategy of the district focuses on core targets as follows:

1. Concentrate to economic sector, adequate zoning and diversification of local industries
2. Focus on drawing up cultivation models and process of post harvest preservation and processing.
3. Strengthen livestock husbandry and freshwater fish raising
4. For aquatic products: concentrate on aquaculture based on innovated extensive farming, improve management of aquaculture ponds according to planning and manage water supply and drainage systems
5. Attach special importance to secondary jobs and develop labor exports
6. Promote trade and services

Environmental sustainability of income generating industries remains low. Pesticide utilization in agricultural activities have impacted environment and environmental hygiene and fishing by using mine, electrical gear and heavy lighting has influenced significantly on environment and aquatic resources. Some small scaled industries such as rock exploitation, brick kiln or fishery processing plant have been polluted even though insignificantly.

Orientations of priority investment in coming time are:

1. **Agriculture (investment in irrigation, seeds, breeds and science and technology transfer)**
2. **Aquaculture (investment in improvement of infrastructure serving boats and ships and aquaculture areas)**
3. **Investment in aquaculture and agricultural processing**
4. **Investment in developing crops: eucalyptus, casuarinas, Acacia, cajuput, etc… in coastal idle sandy areas.**

3. Thach Hai commune

Thach Hai is a coastal commune that situated in the north east of Thach Ha district: its east-side borders the sea, west-side borders Thach Ban, Thach Dinh and Thach Khe communes and south-side borders Thach Lac commune. Thach Hai commune has 1,391ha of coastal areas in total, 10 ha of natural ponds and lakes, and 40ha of wetland areas. commune possess about 70 fishing boats with capacity of 18-22 horsepower (serving for *nghe te* – a type of fish capture using electric gear).

Commune total population is 3,500 people. There are 5 villages in which one village is a purely agriculture-based village, two specialize in fishery and other two are mixed of agriculture and capture fishery. This commune specializes in capture fishery with fishery outputs in 2005 was 1,300tons, decreased by 300 tons in compared with 2004. In addition, this commune has tourism potential thanks to its beautiful coastline. However, these tourism potential are threatened by mining plan in Thach Khe commune. Investors are concerned that mining activities shall impact the environment and coastal landscape therefore they temporarily stop constructing tourist areas.

Infrastructure system: transportation roads are fairly good except some inter-village roads. The commune is constructing asphalted inner-village roads linking Thuong Hai – Nam Hai. Irrigation system is almost unavailable.

Agricultural areas are 241.89 ha in total. Being an impoverished coastal land area and lack of water, the commune has transferred its crop structure from rice cultivation to peanut cultivation that can create higher productivity. Arable land for peanut is 115 ha, for rice is 41ha, for sweet potato is 70ha and the remaining are for others.

Livestock husbandry specializes on cows (2,000 cows), goats (2,000 goats) and pigs (3,500 pigs, mainly are sows)

Forestry: tree planting for regeneration bare land and denuded hills in 30ha

In commune income structure, agro-forestry and livestock husbandry contribute 40%, fishery accounts for 30% and tourism services and labor exports take 30%.

Being a poor commune in the district, its household poverty rate is 52% (based on new poverty standards)

In terms of fishing, the commune has main advantages and difficulties as follows:

Advantages:

- Being near the sea with many natural ponds and lakes and wetland is advantageous for aquaculture.
- Fairly good infrastructure, especially good transportation roads, is convenient for traveling and goods exchanges.
- Abundance of labors after harvesting time. People are skillful and rich in experience in fishing. Capture facilities and fishing industry have been developed.
- Experiences on fishery processing even household-based fishery processing level only.

Difficulties:

- Profitability from seafood resources run risk of being exhausted, lack of capital, fishing boats have no anchorage (their anchorages are 8km far from the commune so that they hamper product preservation and processing as well as fisherman traveling)
- Lack of equipment to exploit deep water fish. commune has not been equipped with new capture techniques
- Market branding is in short or less developed. Lack of product preserving facilities and techniques. According to commune staff, in a fishing reason, its fisherman fish 1,500 tons of seafood, in which only 500 tons are sold and the other 1,000 tons are used for shrimp paste.
- However, the most serious barrier for seafood development now is no support policy such as tax exemption or reduction to encourage aquaculture development. Fishery extension has not been considered.
- In terms of general situation, there are many redundant labors in Thach Hai, while income generating industries have not developed here.

Thach Hai people's committee has proposed key industries as follows:

1. Invest to shifting occupational structure into off-farm sectors (aquaculture, processing industry, etc…)

2. Create fish market
3. Field reclamation (unproductive rice field are changed to aquaculture one), ensure irrigation
4. Upgrade equipments; carry out multi-industries in a boat (exploitation of fish, shrimp, tiny shrimp, deep water fish, etc…)
5. Improve awareness about aquaculture, seafood capture and environment protection techniques.

Main income resources of people in Thach Hai commune are ranked as follows:

1. **Fishery:** males are in charge of capture activities, females specialize in product processing and marketing. This industry is at risks from natural disasters, unsafe (due to explosive utilization), etc…
2. **Livestock husbandry:** mainly taken by females. This industry often faces risks such as diseases, unstable market price (outputs), weak breeds, etc…
3. **Agriculture:** mainly taken by females. Its main risks are bad weather, pestilent insects, sandy land (unsuitable), low productivity, led by one season crops, etc…

4. Tuong Son commune

Located in the south east of Ha Tinh province, the commune is an inland area in coastal line of Thach Ha district. The commune total area is 823.19ha, in which cultivation area is 334ha (area for 2 rice crops per year is 119ha, for other cash crops is 130ha), potential area for aquaculture is 165ha (planned areas for aquaculture is 74ha brackish and salty water and 34ha freshwater). In the last 3 years, the commune has intensified rice cultivation and fish raising to create higher economic efficiency.

The commune's river dyke is 9km long and often infected by salt. It is a purely agriculture-based commune with terraced fields, impoverished soil and lack of water. Agricultural income contributes 70% of total incomes, husbandry accounts for 10% and fisheries, and other industries make up 20%.

Infrastructure: inter-village roads are earthen, in which there are only 5km of asphalted roads and 5km of concrete channels in the end of Ke Go irrigation project.

There are 10 villages in the commune with total population of 4,389 people/ 967 households. According to new poverty standards, there are 412 poor households' accounts for 42.6%.

Given such natural conditions, the commune meets advantages and difficulties in sustainable fishery development as follows:

Advantages:

- There are 9km of river dykes and a river for water regulation
- Areas for aquaculture is extendable
- A clear and easy-accessible credit regime
- 1,600 labors are redundant
- Hardworking people
- Driven by a resolution on aquaculture development

Nevertheless, people here face with difficulties as:

- Flood-tide influences
- Lack of investment capital
- Diseases
- A plan for ponds and lakes and for transforming low productive rice fields into areas for aquaculture is unavailable
- Market is absent (or price is driven by private traders)
- Lack of seeds and breeds
- Abundant idle time and unemployment
- Support from projects is unavailable
- Due to severe weather conditions, aquaculture can last for only 4 months in a year
- Less developed aquaculture infrastructure that requires large investment. Nevertheless, people here are lack of capital and afraid of risks so that investment has not been significantly carried out.
- Polluted water sources (as a consequence of the province's dumping ground)
- Cultivation, husbandry and aquaculture techniques are unavailable

II. MAIN FINDINGS FROM COMMUNITY ANALYSIS

1. Livelihood means, risks, and impacts on the poor and sustainable development

In general for coastal areas, people are more likely to diversify their income sources with different livelihood means. Characteristics of terrain and natural climate in coastal areas allow development of various industries: agriculture, industrial crops in sand-banks, marine

tourism and eco-tourism… and especially exploiting source of seafood and brackish-water and fresh-water aquaculture. However, it can be seen that while natural conditions bring about many income sources for people in coastal area, they also affect their livelihood means (i.e. changeable weather and climate, storms, floods, low quality land or saline infected and infertile soil…). On the other hand, exploitation of natural resources must consider sustainable development - exploiting together with preserving, maintaining and developing natural resources. For this reason, when consider and evaluate livelihood means, research group used many criteria, especially such criteria as possibility of income generating for the poor, possible risks, sustainability (pollution and environmental ruin) and supports from the Government, local government as well as international organizations…

Two surveyed communes are Thach Hai (a coastal commune) and Tuong Son (an inland commune). Their conditions of terrain and climate are different, so their possibility of exploiting natural income sources to develop livelihood means is not the same. Therefore, in our analysis, evaluation and classification according to priorities of livelihood means, we will consider communes separately.

- For Thach Hai, as a coastal commune, *inshore capture fishery* is livelihood means, which generates highest income for the commune's people. Nearly 100% males in working age use this livelihood means and have an average monthly income of VND 1 million per household. This livelihood means brings about a stable income source for poor people in coastal area. However, people here live on fish catching only in fishing season of about 5-6 months. For the rest of the year they must look for other jobs. Despite being a largest income source, due to poor fishing equipment (mainly fishing net, small-mesh net to scoop up marine tiny shrimps; small boats of 18-22 horsepower unable to go offshore fishing), sometimes people here must use destructive means of fishing (fishing using mines, electrical gears, heavy lighting…) harmful to people life and have bad effects on marine ecological environment.

On the other hand, inshore capture fishery often bears many risks, especially weather: sudden storm, flood are often seen in the central region. Wrong and abusive capture has made resource of aquatic products become exhausted. In the opinion of local people, in recent years resource of aquatic products in sea has dramatically reduced.

Livelihood means of second largest income source in Thach Hai is fishery processing (fish source, shrimp paste, dry fish, dry small shrimp and small shrimp paste). 90% of females in commune take part in this livelihood means and get an average annual income of about VND 3 million per household. Although fishery processing in Thach Hai manual and mainly in households, this livelihood means is highly appreciated by community because it helps to

create jobs for most women and has potential for future development. For the time being, some women in the commune get loans from Oxfam Britain fund, supports women with an interest rate of 1.5% (first loan of VND 300,000-500,000, second loan of VND 1-1.5 million, interest is paid by installments in 18 months). Besides, Women Union forms saving groups of 13-15 people, each contributing VND 200,000 without interest rate to lend to group members on a rotational basis. With this source of loans, women in Nam Hai village have founded four models of fishery processing to provide seafood for market inside and outside the province. For this livelihood means, many women in the commune think that it is necessary to develop fishery processing models and they wish to get more loans to build fishery processing groups in the commune. However, this livelihood means will have negative effect on the environment unless there are good means of preservation and processing.

Due to lack of modern equipment and facilities to preserve and process caught fishes, spoiling fish may pollute the environment.

The third livelihood means is agriculture. Despite coastal area where soil is infertile with mainly sand and lack of water (rain-fed fields and no irrigation canal) which enables only one crop a year, all households in this area have agricultural land and produce mainly to subsistence due to old thought: 'farmers must have land for cultivation'. Although there has been a change in crop structure (changing from rice cultivation to peanut and sweet potato cultivation), agricultural production has brought about a very low income source (about VND 200,000 per year per household for farming and about VND500,000 per year per household for livestock husbandry) due to high cost inputs. In addition, use of fertilizer and insecticides for cultivation causes bad effects on the environment.

The fourth livelihood means is freshwater fish rising. At present there are 15 ponds and lakes in Nam Hai village to raise fish of all kinds, call for tender every three years, mainly including: catfish, butterfish, carp, African carp, and pike and trench bream. However, freshwater fish rising in Thach Hai is under-developed, spontaneous, and little invested as people there only buy a small amount of breeding fish and make use of available sources of residual food for fish. As a result productivity is very low. Average income of freshwater fish raising households is VND 500,000 per year per household. Fish products are consumed mainly by household themselves and local people in village and commune. In the opinion of local people, if they have money to invest in high-quality fish breeds and concentrate feed for fish, productivity will be much higher and, of course, generate 5 times higher income than that from agricultural production. Therefore, in the future this will be one of livelihood means helping the poor to diversify their income source because it does little harm to the environment and brings about a significant income source for local people in coastal area.

However, this livelihood means can only meet demand of the commune and the district, because freshwater fish is popular and can be bred in other regions.

The fifth livelihood means is small business (groceries in market and hamlet…), which is used by several households generating an all year-round job with an average income of VND 200,000-300,000 per month. This kind of small business has few chances to develop due to the poor demand of local people.

In Tuong Son commune as an inland commune in coastal area, major livelihood means of local people include:

First is agricultural production. This livelihood means accounts for 70% of total income of people. It is a traditional way of income generation for rural people. However, for coastal people, agricultural production and rice cultivation often face many difficulties: weather: prolonged rains (water-logged soil and miss of cropping seasons resulting in low productivity; high temperature and drought resulting in lack of water for irrigation (particularly at the end of canal) – in 2005 the commune completely lost 45ha of rice fields due to lack of water); bad quality seeds, insects… In order to overcome such difficulties, the commune has had three water pumping stations built; seed fields grown; saline prevention dyke repaired and supplied concrete guidance in rice cultivation technique according to cropping schedule and season… As a result agricultural production has been improved. On the other hand, too high input costs lead to low productivity of agricultural production. Additionally, utilization of fertilizers and insecticides does harm to the environment.

As for livestock husbandry, households often raise pigs, cattle, and poultry. There is no big cattle herd. Commonly-observed difficulties in livestock husbandry includes epidemic diseases because the poor have little money to invest in standard livestock husbandry facilities, there is no market for product consumption and the commune has not had new animal breeds such as porker, hybrid Sind bulls, and lack of feed and fodder for cattle. On the other hand, with an unhygienic system of livestock husbandry facilities, livestock husbandry also does harm to the environment.

Second livelihood means is aquaculture. At present in Tuong Son commune, model of combined fish-rice rising is developing as it brings about high economic returns. With fish-rice rising, little investment is needed as local people only need to leave fish in rice field and make use of available feed sources and it is harmless to the environment. This livelihood means may develop in the future as it is suitable with coastal conditions and generates income for the poor.

Currently, aquaculture (shrimp, crab, turtle...) has started to develop in Tuong Son. In Bac Binh village, for instance, there are 68 aquaculture-based households. Local government has

certain supports such as tax extension and yearly training courses for aquaculture-based households. However, this livelihood means requires much investment and have high risks due to lack of experience and aquaculture techniques. Local people cannot access market and are forced to sell at a low price to private traders (their price for common tiger prawn is only half of market price). In addition, risks of natural calamity and diseases are also obstacles for development of this livelihood means. On the other hand, it is not easy for poor people to access aquaculture because it requires big investment and scientific techniques knowledge.

Third livelihood means is secondary jobs: construction workers, hired laborers after harvest. This livelihood means is unstable in terms of jobs and income, but it is a significant income source for the poor.

***Based on surveys in Thach Hai and Tuong Son communes, we have made comments as follows*:**

- Diversification of income sources in two communes is different due to their different land natures and natural conditions as well as capacity to access and exploit coastal sources.

Thach Hai	**Tuong Son**
- Major income source is inshore capture fishery - Limited possibility for aquaculture development - Fishery processing has been initially carried out but mainly manual and taken place in households - Limited incomes form agriculture due to impoverished soil and lack of water - Less influenced by market - Influenced by weather and climate conditions	- Major income source is from agriculture even though productivity is low (mainly based on rice cultivation while livestock husbandry has not been developed) - There are many possibilities for aquaculture development that generate higher incomes than agriculture does, especially combined methods of fish raising and rice cultivation - Non-agricultural production has not yet been developed - Largely influenced by the market and price is influenced by private traders - Significantly influenced by unexpected weather conditions

- According to general analysis on impacts on individual livelihood of various factors (income level, environmental sustainability and availability of supports) in two communes, livelihoods are ranked by priority orders as follows:

+ Aquaculture, especially freshwater fish raising and combination of fish raising and rice cultivation

+ Rice and other cash crop cultivation and livestock husbandry

+ Capture fishery

+ Fishery processing

+ Other industries (hired laborers, tourism services, labor export, etc…)

- Exploitation of aquatic resources in Tuong Son commune is more sustainable than Thach Hai because it does not destroy marine environment as Thach Hai does. Freshwater fish raising and combined fish raising and rice cultivation not only make use of available food but also create high economic returns. However, aquaculture here meets with many risks such as changeable weather (rain, flood, drought, etc…); diseases and people are in short of fishery extension knowledge and aquaculture experiences.

- Given that agricultural production (rice and other cash crop cultivation and livestock husbandry) in these two coastal communes creates low incomes (particularly in Thach Hai commune), it is farmers' traditional livelihood so that they want to maintain it. Agricultural production in coastal communes always meet with difficulties such as: lack of water, impoverished and salty soil, etc… This livelihood importantly impacts the environment due to unsafe fertilizer and pesticide utilization and husbandry hygiene.

- Aquaculture exploitation and processing generate large incomes for the poor. However, this livelihood also runs risks of changeable weather and decline in inshore aquatic resources. In addition, use of mine, electrical gear and heavy lighting for fishing are seriously threatening marine environment in Ha Tinh province.

2. Market and its impacts on income diversification of local people in coastal area.

Market is a factor having great impact on those livelihood means products. In area of survey, market (both input and output) also have great impacts on income diversification of local people, especially aquaculture and fishery processing. In Thach Ha commune, both input market (breed, feed, insecticide…) and output market are under no control but driven by private traders. There has been no control and inspection about input quality and support from local government in forming channels of distribution. In recent years, strong development of aquaculture leads to higher demand for breed, feed and epidemic disease

preventive medicine for this livelihood means. System of production and breeding service supply for both salt water and fresh water aquaculture is insufficient, meeting only 30-40% demand for breed in shrimp and crab rising… Meanwhile, flow of breeds and materials from other places to the market is becoming bigger. (For example, common tiger prawn from Da Nang, Khanh Hoa, other neighboring provinces and China, frog and turtle from northern provinces…, feed from southern provinces and Thailand…). On the other hand, the district has not had a centre for quality examination of breed and material for aquaculture, so local people have to buy breeds and materials from private businesses with uncontrollable quality, exposing too many risks and epidemic diseases. At present, the province has invested in construction of common tiger prawn breeding farm to satisfy demand for breeds of local people in the province.

Output market for aquatic products and processed seafood is large, within the province, in the country and in China. However, the district has not organized a system of outlets for aquatic products, farmers are often forced to sell to private businesses at a low price, normally a half of market price. Therefore, in order to develop this livelihood means, market information as well as necessary support in distribution is essential and should be provided to producers in coming time.

3. Supports from organizations for the poor to develop aquaculture

Policy to make aquaculture a key economic industry in coming years has received much attention of Ha Tinh province and Thach Ha district with a series of legal documents facilitating development of aquaculture. Ha Tinh province has been and will be carrying out many programs and projects to promote aquaculture industry such as: Brackish water and freshwater aquaculture development program; Program of aquaculture in the sea and on sand; Aquaculture breed development program; projects of irrrigation system construction for brackishwater aquaculture; projects of building fish ports, fish markets, sheltering and anchorage areas, and fishery processing villages... However, those projects are in initial stages, so their supports are not clearly observed.

Policy of transforming low productivity agricultural land areas into areas for aquaculture of the province and the district is judicious and in the hope of local people. However, although there has been encourage policy, there has been no specific mechanism and policy, so there are some troubles in implementation in many communes. In two surveyed communes, transformation is very slow because local government cannot ensure a fundamental infrustructure for aquaculture such as: concretization of system of saline prevention dykes, system of irrigation canals and drainage... (Tuong Son commune); lack of fishery extention support: providing scientific technical knowledge about aquaculture,

epidemic diseases, capture fishery, buidling a pilot model, providing information about markets for breeds, feed and distribution... because investment in aquaculture mainly relies on limited budgets.

Support for this livelihood means from international organizations is limited. Beside small loans from Women Union to process aquatic products (in Thach Hai), local people borrow money from Bank for Agriculture and Rural Development to invest though loans, which are small in comparison with need for investment due to high risks in aquaculture.

4. Poor's accessibility to aquatic resources:

For the poor people in coastal area, exploiting available sources of aquatic products *(inshore capture fishery, natural fish capture, mollusk farming on mainland and rice cultivation combined with fish raising) is an important livelihood means for the poor because it requires little investment but generates a higher income.* Although destructive methods of fishing are used in marine capture fishery in Ha Tinh province, destroying seriously the environment, the poor has no other choice as they have to care about their existence. "We know that our present exploitation will put a burden on our children's generation due to destruction to marine environment, but we will die now if we do not do that" (said male group in Nam Hai village of Thach Hai commune). Therefore, orientation that Thach Ha district is striving for in the coming years is financing for poor households to help them to be equipped with better boats, or establish fishing cooperatives for the poor to take part in and transform occupational structure of coastal households to livelihood means that exploit aquatic resources in a more sustainable manner. Plan for shifting from low productivity agricultural land areas into areas for aquaculture is a good goal taking the poor in coastal area out of poverty. However, the fact in surveyed places shows that the reason why poor households cannot move to aquaculture model is lack of initial investment. In surveyed communes, only medium and better-off or rich households are capable of investment in aquaculture. On the other hand, these models have not been developed due to big investment, high risks and lack of necessary scientific technical knowledge and experience of local people.

III. RECOMMENDATIONS AND PROPOSALS FOR MODEL SELECTION

Survey in two communes of Thach Ha district shows that local people in coastal area have many opportunities to diversify their sources of income through development of different livelihood strategies. However, obstacle is that the poor people are poor in both capital and knowledge, so while financing for the poor to develop any livelihood means, it is necessary to help them with both capital and knowledge.

With model of coastal communes, it can be invested in different fields to diversify sources of income for the poor: aquaculture + capture fishery + agriculture + aquatic product and agricultural produce processing industry and + tree plantation (eucalyptus, casuarinas, acacia aneura...) on sandy land in coastal area**.**

- However, every commune has their own strengths with different proposed investment priorities. In Tuong Son for example, investment in infrastructure for swamps to raise shrimps and fish will get good effects in return and create many jobs for local people. Swamps are private-owned but their repair requires a great number of 50-60 labors. On the other hand, the development of aquaculture will lead to development of other services (breed supply, feed supply, product distribution, semi-processing...) which attract much labor. Nevertheless, investment in aquaculture requires a large amount of capital (for example, it costs VND 250 million to invest in a 3-ha swamp for extensive farming including infrastructure construction, swamp building, water regulation, breed, feed...) while risks are high due to changeable weather and lack of raising techniques. *Fish-raising and rice cultivation is a model which is multiplied and initially has brought about obvious effects for people of Tuong Son commune.*

- In communes like Thach Hai, financing for poor fisher folks to catch aquatic products is also a livelihood means generating a stable income source for the poor. At present in Ha Tinh province, yield of capture fishery represents a large proportion in total output of aquatic products of the province. Although yield of aquaculture has been quickly increasing in recent years but it is only one-third of total seafood output (see graph 2 in part I). As a result, this is still an important livelihood means of the poor who live in wetland, to exploit sources of income in coastal area. However, there should be financial support for fisher folks to purchase better facilities that enable them to catch more kinds of fish and avoid using present destructive methods. Investment can be made in form of establishing fishing groups or cooperatives to enhance strengths and avoid risks for fisher folks.

- Agricultural production in coastal communes often has low productivity due to poor soil which is exhausted and much affected by the weather, yet it is still an indispensable livelihood means of farmers. Hence, it should be maintained to generate more income for local people in coastal area. Additionally, cattle raising is also an effective way.

- Model of fishery processing in form of cooperative or enterprise also needs financial support in coming time. This livelihood means attracts many poor female people and also generates a significant income source for the poor in coastal area.

- Model of planting eucalyptus, casuarinas, and acacia aneura... in coastal sand banks is also a livelihood means generating income for local people in coastal area in the future. Now

Thach Ha district have received orders for products from those planted. However, the district is facing with difficulties in capital during their implementation of land use planning for such plantation because the district is poor and their budget is limited. As a result, this model has not been given priority to develop. However, in the future provided that there is enough investment capital, this will be a means to diversify sources of income for local people in coastal area.

ANNEX

1. THACH HA DISTRICT- HA TINH

Livelihood	**Capacity to generate incomes for the poor**	**Environmental sustainability level**	**Available support**
Agricultural production Cultivation Husbandry	1	(+) Pesticide - (-)	Irrigation system (55-60%) IFAD, O models Rural market planning Cross-breeding with Sind bulls
Afforestation Extraction of forest products	4	(-)	OXFAM Belgium 5 million ha, 661
Salt production(2 communes)	6	(-)	(-)
Services Small scale industries	3		Spontaneous (by people) tourism services
Aquatic products (2) Fishing Processing Aquaculture (1400 ha)	2	- Mine, electrical gear - Small mesh fishing nets - Heavy lighting + - Underground water - Diseases - Salty infected water	SUMA (DANIDA) SCFUK (88-89) Budget (40 million HCSN) Offshore fishing Models (provincial and district supports) British OXFAM (processing) Financial support for aquaculture is unavailable Aquaculture support regime
Labor exports Ore, rock and sand exploitation Other industries	5	+	

	Difficulties	**Advantages**
Agricultural production	– Market – Weather – Material inputs – Weak infrastructure (inner-field roads) – Intellectual standards of people: market knowledge and techniques – Capital – Impoverished soil - Production practices	– Plentiful labor forces – Industrial plants have been developed – Transportation (by roads and waterways) – Having orientations for planning of crops and livestock

	Difficulties	Advantages
Aquatic products	- Profitable sources is becoming exhausted - Ponds and lakes have not been in a uniform plan - Sources of seeds and breeds - Capture techniques - Backward and undiversified capture facilities - Manual processing - Diseases - Natural disasters - People's attitudes towards environmental and fishing ground protection are limited - Processing technology is unavailable - Material infrastructure - Seeds and breeds (in short) - Unstable output markets - Anchorages for aquaculture exploitation are unavailable (to shelter from storms)	– Having potentiality for aquaculture area – Potentiality (27km), diversified and rich fishing ground – Determined to be a core sector – Convenient transportation (as for uncompleted regions)

Core investment options

1. Aquatic products (aquaculture, processing and fishing).
2. Agricultural investment
   + Seeds and breeds
   + Science and technology.
3. Post-harvest processing industry.
4. Investment in plant development (eucalyptus, casuarinas, cajuput, etc…) in coastal wild sandy areas.

2. Thach Hai commune

Resources for fishery development

Resources	**Advantages**	**Difficulties**
Water areas in coastline:1391 ha 10 ha of natural ponds and lakes 40 ha of wetland	Tourism development Fishing development Capture techniques Facilities and human resources More than 10 ha for aquaculture	Profitable resources are running exhausted Production in 2 seasons only Lack of capital No anchorage
Infrastructure 70 boats (18 – 22 horsepowers) (serving for *nghe te*)		Lack of capital No anchorage No transportation leading boats to berths Lack of facilities No facility for deep water fish exploitation Have not equipped with techniques In short of/less developed branding in the market Lack of equipments and techniques for post harvest preservation
Spontaneous tourism		Have not attracted female labors Lack of industries

3 key points are proposed

1. Investment in occupational transfer
2. Create fish market
3. Field reclamation (transfer to aquaculture), irrigation

- Upgrade equipments; carry out multi-industries in a fishing boat (exploitation of fish, shrimp, tiny shrimp, etc…)
- Improve awareness about occupational transfer and environment protection.

<u>Demands (Selection of 3 most important demands)</u>

1	Needs of facilities and equipments: Global positioning receiver (GPS), sound-based detecting machines, product preservation	1
2	Funding for fishery extension investment	
3	Technical training, improve awareness about occupational transfer	1

4	Knowledge on processing and market	
5	Industry research and development	
6	Planning for production areas and land reclamation	3
7	Training on husbandry techniques, good seeds and breeds, disease prevention	
8	Prompt administrative procedures, labor protection	
9	Planning and investment in tourist infrastructure	
10	Build up a fish market in coastland	2
11	Investment in seafood preserving and processing system	

Income resources

Industries			**Risks**
	Male	**Female**	
1. Fishery 1	Fishing +	Processing -	Natural disaster (failure of crops), unsafe (due to explosive utilization)
2. Agriculture 3	-	Mainly +	Weather, pestilent insect, sandy land (unsuitable)
3. Livestock husbandry 2	-	Mainly +	Diseases, unstable market price (outputs), seeds and breeds
4. Labor exports	+	-	Cheated by companies (low incomes)
5. Tourism	-	+	
6. Trade	**-**	**+**	

3. Tuong Son commune

Resources	**Advantages**	**Difficulties**
- Area: 165ha of which 74.7 ha of exploited salty water area and 34 ha of fresh water areas with an established fish model, and remaining 50 ha has not been exploited - Plentiful labors: 1,600 labors	- Water from Rao Cai available - Plentiful and hardworking labors - Driven by a resolution of people council on aquaculture development - A clear credit regime	- Flood tide influences, small dykes - People are managing themselves, no investment - In short of investment sources (people are managing to borrow loans at high interest rates themselves from informal sources, maximum credit is VND10-15million) - Diseases

Resources	Advantages	Difficulties
		- No planning for ponds and lakes, spontaneous development, no transportation - No market (price driven by private traders). Shrimp price in market is VND120 – 160,000/kg, while people sell at VND40,000/kg only - Common tiger prawns, sea craps, inland shrimp, amurs, carps, nonsexual tilapia, breams, sheatfish (lack of breeds) Capital: Policy Bank: interest of 0.65% Agricultural Bank: interest of 1.25% Low credit limitation: VND15 million at maximum - Lack of employment, plentiful idle time after harvest time - No investment and development project - In short of science and technology, mainly based on experiences - Rely on natural conditions: aquaculture activities last for 4 months only in a year - Unqualified infrastructure - Polluted water sources as a consequence of dumping ground

Matrix 2: Livelihood selection

Income sources	Risks/difficulties	Solutions	Proposals and recommendations
1. Agricultural production (80%) 380kg/head/year	- weather (drought, flood) - Pestilent insects - Water sources for irrigation (in 2005 45ha of crops was totally failed that created no income) - Poor quality seeds - High output prices - Poor soil: sandy	- Build up 3 (mobile) petrol pumping stations - Establish farmer seed field (commune shall buy good seeds for local replication to supply to farmers) - Mobilize people to carry out saline	- Infrastructure investment: electric pumping station to prevent from salt infection, drainage culverts, irrigation canals and ditches, inner field roads - Capital support: low interest, increase credit duration

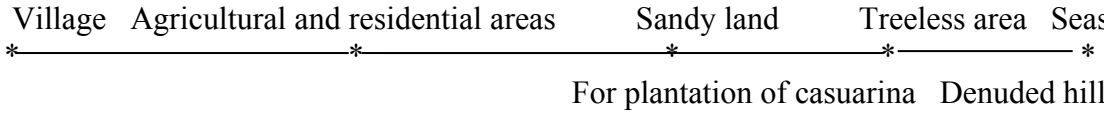
Income sources	Risks/difficulties	Solutions	Proposals and recommendations
	impoverished and salt infected soil	prevention activities (repairing dykes) - Give directions on crop schedules - Cropping structural conversion (fish-rice model)	- Investment in agricultural mechanization - Support for post harvest product preservation process - Support for seeds (seedlings) of high quality
2. Aquaculture (10%) Carried out by 68 households	- Diseases - Acts of God - Capital - Infrastructure - Breeding livestock (not available in Ha Tinh that need to be bough from other provinces at high prices) - Output market - Lack of science and technology information - High feed price with uncertified quality	- The commune has a policy to encourage husbandry. Areas for husbandry are not taxed (based on one year contracts but all taxable items have not been collected) - Having a resolution of people council - Husbandry households have been credited for investment such as drainage culverts, dyke making… but those activities are still weak and uninsured - No measure to overcome aquaculture problems	- Upgrade infrastructure, equipments and facilities - Adjust planning - Science and technology training - Having specialists and specialized staff at grassroots level - Capital investment (increase credit norm, low interest) - Draw up models - Support for market information
3. Secondary industries (5%) (Construction, porters, hired workers, natural fishing, etc.	- Unstable (sometimes out of work that have no income) mainly related to construction and porters - Being spontaneous - No traditional industries	No measure rather than planning to extend rural market	Support for building market to develop services
4. Livestock husbandry (10%) Pigs, buffalos, cows,	- Diseases - Outputs, prices - Breed quality (old	- Having a resolution to transfer agricultural structure	- Establish small-scaled, household-based farms and large

Income sources	Risks/difficulties	Solutions	Proposals and recommendations
chicken, ducks, etc…	breeds are remained) - In short of capital - Lack of cattle-feed (grass), no grazing ground - Uninsured Livestock husbandry facilities	and encourage agricultural activities - Support for vaccination against epidemics (in 2001 all cattle in one village died) - having orientations on cattle breed reclamation but out of capacity (capital, sources of breeds, science and technology, etc …)	farming - Science and technology training - Support for capital and breeds - Infrastructure investment to develop farms - Outputs, markets

Priority demands	**Ranking**
1. Investment in infrastructure serving for agriculture - Inner filed irrigation canals and ditch - Pumping stations - Inner field roads - Drainage culverts (water-flow regulating culverts) - Saline prevention and fresh water protection dykes	1
2. Establish livestock husbandry and breeding reclamation models (focus on reclamation of breeds)	3
3. Infrastructure for aquatic products - Dyke system - Drainage culverts and water supplying culverts	2

Ecological transect walk: Nam Hai village – Thach Hai commune

From village center to seaside: about 150- 200 m long



Total agricultural areas: 27ha, cultivable areas: 15ha, agro-forestry planting areas: 10ha,

poverty rate: 50.7%

Agriculture land: potato, rice and peanut	**Forestland**: Plant casuarinas in treeless areas and denuded hills (for fuel), and a few of Acacia trees (planted by province's Women Union)	**Coastal areas**
- Incomes contribute 10-15% - Rely on natural conditions (no canal and ditch for irrigation) - Land of type 3 (infertile soil) - Old seeds: low productivity - Transfer to peanut cultivation - Peanut selling does not meet difficulties in terms of output market	- Used for fuel only - Risks: Rely on natural conditions, cultivate only takes place whenever it is rainy but not sunny	- Focus on exploitation of small fish. Use of fishing inshore waters. There are 28 fishing boats of 15 horse powers - Incomes: generate 80-85% of total incomes - Women process seafood at home. Risks: Rely on natural conditions, offshore fishing always takes 6 months in a year in summer and autumn. Fish are sold on the sea or at home - 7-8 households are credited by Women' Union to carry out fishery processing that create fair incomes: from VND2-3million/capita/year

In order to settle difficulties in livelihood activities, people here have proposed some necessary supports as follows:

- Change plant varieties (rice and sweet potato varieties)
- Arable areas need to be planned and concentrated
- Insurance for fisherman is available
- Investment in offshore fishing (fishery facilities: handy short-waved communication tool, fish-searching machine, etc.)
- Investment in science and technology : technical staff who are able to use new tools
- Apply science and technology in processing
- Investment in fishery processing warehouse or factories

Re-planning, if areas cannot afford agricultural production, they shall be transferred to aquaculture.

5. Bac Binh and Tuong Son villages

Residential /cultivable areas	**Aquaculture**
1 rice crop field : 5th – 8th months of Lunar year Cash crop fields: Peanut 2nd – 5th months of Lunar year Maize and potato: 10th – 12th months of Lunar year Difficulties: weather, pests and insects Water for irrigation Seeds (10kg/ VND60,000) Capital Demands: Construction of canals for irrigation (1) Inter-village roads (2) Establishment of models (3) Saline prevention dykes (6) Capital support (5) Techniques (4) Seeds (7) Credit: Bank for Agriculture and Rural Development in Thach Ha: interest rate: 1.25% For hunger elimination and poverty reduction: Policy Bank: interest rate: 0.65% (0.5%) I FAD provides credits for women: 0.9 - 1% (V1: 1.5 ; V2: 3) Savings Fund	Shrimps: 2nd – 6th months of Lunar year Craps and fish: 7th – 12th of Lunar year Difficulties: weather (flood), temperature Capital Breeds (bought from Da Nang) Outputs (market) Common tiger prawn: 30 prawns/kg: VND70-80,000/kg 10 prawns /kg: VND 180,000/kg 30-50 prawns /kg: VND 55,000/kg Techniques- Practices Demands: Capital: for reclaimantion of ponds Techniques Breeds Outputs: market information Drainage and water supply system

Demands	**Canals**	**Breeds**	**Capital**	**Techniques**	**Models**	**Inter-village roads**	**Saline prevention dykes**	**Scores**
Construction of canals for irrigation	X	Canals	Canals	Canals	Canals	Canals	Canals	12
Breeds	Canals	X	Capital	Techniques	Models	Roads	Dykes	1
Capital	Canals	Capital	X	Capital	Models	Roads	Dykes	4
Techniques	Canals	Techniques	Techniques	X	Techniques	Models	Roads	4
Models	Canals	Models	Models	Models	X	Models	Roads	7
Inter-village roads	Canals	Roads	Roads	Roads	Roads	X	Roads	10
Saline prevention dykes	Canals	Breeds	Breeds	Capital	Techniques	Models	X	4

VIETNAM

ENGAGEMENT OF POOR FISHING COMMUNITIES IN THE IDENTIFICATION OF RESOURCE MANAGEMENT AND INVESTMENT NEEDS

NINH THUAN PROVINCE

TABLE OF CONTENT **Page**

I. BACKGROUND

Vietnamese Institute of Economics under Vietnamese Academy of Social Sciences in cooperation with World Bank and Center of Development and Integration under Asian-Pacific Economic Center organized a prefeasibility study mission to collect consultation ideas for the formulation of project "Support to community's exploitation and protection of coastal resources".

Ninh Thuan is among 5 selected provinces to be surveyed for project formulation. This report summarizes major findings from field study of the consultation mission.

II. OBJECTIVES OF THE MISSION

General objective is to collect necessary information for formulating a project targeting pro-poor fishery community via sustainable development and management of fishery and coastal benefits. Specific objectives are reflected in the following activities.

III. ACTIVITIES

a. **Survey team***:*

1) Dr. Mai Thanh Cuc, Team Leader
2) Dr. Dinh Van Dan, Member
3) MSc. Nguyen Viet Dang, Member

b. Activities

Timing	**Activities**
5 March 2006	Leave Hanoi for Ninh Thuan
6 March 2006 Morning	- Work with Provincial People Committee, Department of Agriculture and Rural Development, Department of Natural Resources and Environment, Farmer and Fisherman Union, Women Union, and Fishery Union
6 March 2006 Afternoon	- Work with Department of Planning and Investment and Branch Office of Statistics
7 March 2006	- Work with People Committee of Ninh Phuong rural district, Office of Agriculture and Rural Development, Office of Planning and Investment, Office of Natural Resources and Environment, Representative of Women Union, Bank of Policy, Office of Fishery, Fishery Union, Chairmen of communes of Phuoc Dinh and Phuoc Diem, Rural District's Branch Office of Statistics
8 March 2006	- Work with Phuoc Diem Commune's People Committee, Commune's Party Committee, Youth Union, Women Union, Farmer and Fisherman Union, Head of Thuong Diem hamlet - Work with a group of poor women and a group of both men and women - Have a meeting with all the above groups

9 March 2006	- Work with Phuoc Dinh Commune's People Committee, Commune's Party Committee, Youth Union, Women Union, Farmer and Fisherman Union, Head of Vinh Truong hamlet - Work with two groups of women and both men and women - Have a meeting with all the above groups
10 March 2006	- Listen to reports from Department of Fishery's projects on Kappaphycus alvaresii growing and shrimp cage farming - Preliminary agree on survey findings with Department of Fishery
10 March 2006 Afternoon	Leave Ninh Thuan for Hanoi

IV. METHODOLOGY AND OUTPUT

a) *Methodology:* Community participatory approach was applied throughout the field survey process. A number of PRA/PLA techniques and tools were applied as follows: (i) Direct observation (ii) Semi-orientation interview; (iii) Secondary information; (ii) Group discussion; (iii) Transect walk; (iv) SWOT; (v) VENN diagram; and (vi) Meeting.

b) *Outputs of the field survey*

- Field survey report (this report);
- Report on Kappaphycus alvaresii cage farming;
- Report on Ninh Thuan's Socio-economic State in 2005;
- Report on Ninh Thuan's State of Agriculture - Forestry - Fishery in 5 years (2001-2005) made by Ninh Thuan's Branch Office of Statistics;
- Report on Ninh Thuan's Master Plan on Fishery Development in the period 2001-2010;
- Report on Ninh Phuoc Commune's Master Plan on Socio-Economic Development until 2010 made by Ninh Phuoc Communne's People Committee;
- Article "Sweet snail raising in Ninh Thuan" on the sustainability of an aquaculture branch on *The Laborer* dated 5 January 2006;
- Article "Deserted shrimp farming, suffered farmers" demonstrating the state of shrimp farming in the Central coastal areas including Ninh Thuan by Thu Thao, 2005;
- Decision No. 112/2004/QD-TTg by Prime Minister dated 23 June 2004 on approval of the program on fishery seed development until 2010;
- Article "Kappaphycus alvaresii changes the life…" by Phan Song Ngan in 2005 illustrating a new livelihood of fishermen in Ninh Thuan;
- Report by Ninh Thuan Department of Fishery on Kappaphycus alvaresii farming in Ninh Thuan;
- Article "Kappaphycus alvaresii paste";

V. SUMMARY ON SURVEY FINDINGS

1. Overview of Ninh Thuan province

1.1 Natural resources

Ninh Thuan province is in the southern extreme of the Central region, bordered on the north by Khanh Hoa, on the south by Binh Thuan, on the west by Lam Dong, on the east by the sea. The province is located in a transport key position of Highway 1A with North - South railway and Highway 27 to the Central Highland. The province's town is Phan Rang - Thap Cham, 350 km away from Ho Chi Minh City, 110 km from Da Lat, 105 km from Nha Trang, and 1,388 km from Hanoi.

The province covers a total natural area of 3,360.06 km^2, in which high mountains account for 63.2%, hilly area: 14.4%, and plain: 22.4%. Ninh Thuan is surrounded by mountains in three directions and by sea in one direction. The western high mountains border Lam Dong; two mountain ranges in the north and south are towards the sea. The terrain slopes down from West to East and from West to South-East.

There are several rivers and streams in the province, and the largest is CAI River. Taken into account its all sub-branches of Me Lam, Sat, Ong, Cha, Lu, and Quao rivers, Cai river system is 246 km long. Besides, Ninh Thuan has some other rivers such as Trau, Quan The, Ba Rau… with total length of 184 km.

The climate is typical tropical monsoon with little rain and the driest and hottest in the country; dry and windy weather makes water evaporate from 1,670-1,827mm/year. The annual average temperature is 27^oC with separate seasons: rainy season from September to November and dry season from December to next August.

Ninh Thuan has a coastline of 105 km and water territory of 18,000 km^2, which is one of the four key fishing grounds of Vietnam with three sea mouths of Dong Hai, Ca Na and Khanh Hai. Total fishery stock is 120,000 tones/year, of which seabed fish is 70,000-80,000 tones/year, and surface fish is 30,000-40,000 tones/year. Annual exploitation capacity comes up to 50,000-60,000 tones. There are more than 500 types of fish, many of them are of high economic value such as red snapper, tuna, groper, codfish, lobster, cuttle fish, squid, bigfin reef squid, in which cuttle fish accounts for most with the catching capacity of over 3,500 tones.

Ninh Thuan sea has several potentials to develop tourism and mineral exploration with beautiful beaches of Ninh Chu, Ca Na in association with Cham cultural works. A series of hotels and restaurants and people's hospitability also contribute to tourism development.

Moreover, many shores, lagoons, and lakes of total area of more than 3,000 ha provide favorable conditions for salt production and large-scaled aquaculture in Dam Nai, Ca Na, Vinh Hy, Son Hai, Phu Tho,…

Situated in hot region with high radiation intensity, Ninh Thuan is ideal for industrial salt production. Salt field area may potentially increase to 1,000 ha with annual capacity of 130,000-135,000 tones, mainly in Dam Vua, Ca Na and the coastal area of Khanh Hai town.

1.2 Social condition

Ninh Thuan is among the poorest provinces of Vietnam with total population of 564,700 in 2005 (of which, men: 278,900 and women: 285,800). Population density is 168 people/km^2.

In present, Ninh Thuan has only 6 administration units at rural district level which are Phan Rang-Thap Cham town and 5 rural districts: Thuan Bac, Ninh Son, Bac Ai, Ninh Hai and Ninh Phuoc with 59 communes, wards and town lets.

There are 28 ethnic groups in the province, most crowded groups are Kinh, Cham and Ra Grai. Many Cham and Ra Grai people live in Ninh Thuan. According to census made in 1 April 1999, Ninh Thuan has 57,100 Cham people, accounting for 11.3% of the province's population and making up for 43% of total Cham people in the country; 47,600 Ra Grai people, 9.4% of the province's population and 49.1% of the country's total Ra Grai.

In general, science and technique cadre force remains little, only 22 per 1,000 people on average. The province lacks of science and technique officials in almost all economic sectors and key production units, and is in shortage of leading expertise in all areas.

1.3 Economic features

In 2005, Production value of agriculture sector was 769 billion VND, decreasing by 12.9% compared to 2004. Internal economic structure of the sector has positively changed: husbandry accounted for 34.2%; cultivation: 57.2%; and services: 8.6%.

Area for rice growing tends to narrow due to drought whereas area for dry plantation or hay is increasing. In 2005, total rice farming area was 17,000 ha, only 50.3% compared to 2004. Area for tobacco was 551 ha (increased by 8.6%), sugar cane: 1.480 ha (increased by 6.5%), mixed maize: 9,525 ha (increased by 31.6%). Capacity of all plants raised, that of rice: 48.2 quintals/ha (up by 1.6 quintals); maize: 27.3 quintals/ha (up by 4.8 quintals), vegetable and bean of all kinds: 81.1 quintals/ha (up by 12.3 quintals). Grape is considered crucial plant with total plantation area of 1,890 ha and total output of 26,000 tones (increased by 14% compared to that of 2004). Furthermore, area of cashew comes up to as much as 6,500 ha, 3,500 ha of which is in harvest with output of 1,225 tones.

In 2005, there are 219,700 heads of cattle altogether, in which 112,300 were cows and buffaloes and 107,400 were sheep and goats. Due to drought, number of cattle tends to be stable. In 2005, there were 41,490 sheep, increased by 6,160 compared to 2004. Sheep raising has better advantages than other kinds of cattle as sheep can suffer drought better and enjoy diversified food sources.

Concerning forestry, to 2005, the province had progressively implemented afforestation plan of around 2,100 ha. Dry plants of high value is being studied to grow in large areas, namely *trom* (241 ha), *neem* (702 ha), transplant cashew (282 ha), and *gio bau* (35 ha).

1.4. Overview assessment of fishery development in the province

Please see full report attached herewith, findings from consultation of officials at provincial level and Ninh Phuoc rural district on preliminary assessment of major activities to develop fishery is as follows:

ACTIVITY	ADVANTAGE	DISADVANTAGE/ BARRIER	SOLUTION/ DIRECTION
Fishery exploitation	- Key fishing ground (MOFI): Deep water, large stocks; many surface fish (anchovy, scad), cuttle fish and few tuna - Long coastline - Few storm - Convenient transportation: close to railway, road, easy circulation - Good markets, easily access to Lam Dong, Da Lat, Nha Trang, Ho Chi Minh City - State investment: encourage development and facilitate loan	- Poor people, lack of capital - Low knowledge: high illiteracy rate, many young cannot read and write, children drop out schools - Many children: Many families have 4-5 children, even 9-10 - Unequal use of labor: Men go out to sea, women stay home (Men earn money, women do house work). Few women do services or produce fish sauce. - Preliminary processing leads to low value (under developed industry) - Lack of domestic and production water (have to buy) - Low sanitary conditions (most of households have no latrine) - Epidemic: digestive diseases - Consumption pattern: extravagant spending, no planning, no saving, gambling - Obsolete fishing without modern technique	- Change awareness, raise perception (improve capital efficiency, cleaner water and better sanitation,...) through (i) communication and oral dissemination, small groups, loudspeaker; (ii) assist women with small sum: build latrine, aquaculture such as Kappaphycus alvarezii farming, processing (preliminary) caught products. Women can borrow 3-7 million VND (through Women Union at all levels) - Create cooperative groups, community group (group, local government), self-management group in locality - Promote preservation technique after exploitation: apply technology and traditional experience such as: freeze tray, plastic bag...
Aquaculture	- Have potential in natural surface water area for aquaculture - Experienced fishermen - Good seeds of tiger shrimp, sweet snail	- Environment begin to be polluted, affecting water sources for aquaculture - Lack of domestic water - Unadequate planning of aquaculture area, most of the areas are spontaneous - Low popularity in	- Invest in infrastructure: water supply and drainage, environment system, water reservoirs, and centralled wastewater treatment facility - Seek for new aquaculture partners

ACTIVITY	ADVANTAGE	DISADVANTAGE/ BARRIER	SOLUTION/ DIRECTION
	- Good markets - Favorable assistant policy: Grant loan to people; land-use rights can be used for bank mortgage; assign water surface to people; invest in infrastructure	aquaculture - Fluctuant price - Weak epidemic control - Poor households lack of fund - High risks due to weather and natural calamity	and expand patterns of highly economic efficiency so that poor households can participate such as Kappaphycus alvarezii farming in cage with low cost - Build up community patterns in aquaculture to better support poor fishermen
Processing (preliminary)	- Locally available material sources - Rich experience, for example, manufacturing fish sauce, steamed anchovy, dried cuttle fish - Dry climate is favorable for processing - Abundant labor force; easy to mobilize seasonal labors from other localities (processing season)	- Unstable material sources according to exploitation seasons - Manual and obsolete technique, mainly preliminary processing - Low price of products (fish sauce) - Small-scaled production, low competitiveness, no product brand though good quality (for example, Binh Dinh people come to Ca Na buy fish sauce and bottle in Binh Dinh, then bring back to sell in Phan Rang)	- Promote and encourage processing technology improvement - Build up **Ca Na fish sauce** brand - Change backward practice of processing, for example, local people often dry products on sand without any extra technique, which is very unsanitary and affects quality of products - Invest in infrastructure for processing such as processing ground and processing plants... - Improve processing techniques, disseminate good experience

2. Major findings from community analysis

2.1. Overview of surveyed community

a) Overview of Ninh Phuoc rural district (see attached report**)**

Ninh Phuoc is one of two poor coastal districts of Ninh Thuan. The district has 14 communes, wards and towns, 3 of which are coastal communes: An Hai, Phuoc Dinh, and Phuoc Diem. Though in coastal area, An Hai commune has the main livelihood of agriculture (photo attached), and the coastal region of An Hai belongs to some State factories and companies. Therefore, it is reasonable to select the remaining 2 communes (Phuoc Dinh and Phuoc Diem) for prefeasibility survey.

b) Overview of two communes Phuoc Dinh and Phuoc Diem

These two communes are coastal ones in Ninh Phuoc rural district, of which Phuoc Dinh is considered one of the poorest in the district (among 157 poor communes) whereas Phuoc Diem is more better-off. Some basic information about the two communes is as follows:

- ***Phuoc Diem commune:***

Phuoc Diem is one of three coastal communes in Ninh Phuoc rural district and is rather better-off in Ninh Phuoc. Estimated data in 2005 by Commune's People Committee and Office of Statistics are as follows:

- Total natural area: around 7,500 ha
- Number of hamlets: 6
- Number of households: nearly 3,000
- Number of fishing households: more than 2,000
- Number of heads: nearly 19,000
- Major livelihoods: in sequence: (i) Fishery; (ii) Craft industry; (iii) Service; and (iv) Agriculture
- Rate of poor households: 167/3,000 (about 5.5%)
- Fishery: (i) Currently there are 499 fishing boats, 400 of which can do offshore fishing; (ii) There are 110 hatcheries of shrimp seed belonging to 33 owners; (iii) There are 65 shrimp ponds of 50 households; (iv) There are potentially 150 ha (presently down to 80 ha) of Kappaphycus alvarezii farming belonging to 250 households (many of them are poor).
- Craft industry (relating to fishery): (i) Manufacturing fish sauce: traditional industry with famous Ca Na fish sauce. About 100 households manufacture fish sauce with the annual output of 4,000 tonnes, three of which are fishery processing and export enterprises; (ii) Steamed fish: about 50 households process some 4,500 tonnes of fish/year.
- Services: (i) Petrol: there are as many as 8 petrol businesses, and some small households doing the service; (ii) Fishing tools: many households selling fishing tools (no poor households in this group); (iii) Boat building: 11 registered businesses; (iv) Trading (hotel, restaurant, other transactions): small and scattered.

- Agriculture: (i) Farming area: 420 ha (potentially), but only 50 ha under cultivation (for perenial trees), the remaining is for grass raising fro husbandry; (ii) 7,000 heads of cattle (1,000 cows and 6,000 goats and sheep).

- ***Phuoc Dinh commune***

Phuoc Dinh is one of three coastal communes in Ninh Phuoc district and considered the poorest of the commune (among 157 poor communes). Estimated data in 2005 by Commune's People Committee and Office of Statistics are as follows:

- Total natural area: about 13,118 ha with the coastline of 24 km
- Number of hamlets: 5 hamlets, 4 of which are coastal with 3 poorest: Bo Ngu (37 households); Tu Thien (203 households); and Vinh Truong (94 households).
- Number of households: nearly 1,514
- Number of fishing households: about more than 800 households
- Number of heads: nearly 8,328
- Major livelihoods: in sequence: (i) Exploitation/catching; (ii) Husbandry; (iii) Aquaculture; and (iv) Agriculture-Forestry
- Rate of poor households: 24% (according to new poverty line)
- Fishery (catching and aquaculture): (i) Currently there are 172 fishing boats, 35 of which can do offshore fishing; (ii)Aquaculture: About 180 households raise tiger shrimp in the area of 220 ha, only 110 are local households (in the area of 90 ha), the remaining come from other localities; (iii) Kappaphycus alvarezii farming: 350 households in the area of 300 ha, potentially increase by more than 100 ha in Vinh Truong and Tu Thien hamlets.
- Agriculture (plantation-husbandry-forestry): (i) 2,500 ha of arable area, only 200 irrigated ha of which (100 households) is used, the remaining is sandy soil which cannot be used for growing; (ii) Cattle raising: 200 households (10 heads of cattle/ household), including sheep, cow, and goat; (iii) 250 households do afforestation, 10 of them are assigned to manage planted forest.
- Processing industry: (i) Fishery processing: 20 households manufacture fish sauce (some tonnes/household, small scale); 30-40 tonnes/year: 8 households; (ii) 25 households process fisheries, 6 of them do at large scale.
- Services: About 50 households do small trading, and some do wood, smooth works and some do petrol services.

c) Overview of two hamlets Thuong Diem and Vinh Truong

Thuong Diem is the poorest coastal hamlet of Phuoc Diem commune, and Vinh Truong is the poorest hamlet of Phuoc Dinh.

- ***Thuong Diem hamlet***

With total households of 398, 48 of which are poor (13% according to new poverty line), Thuong Diem is considered the poorest hamlet of Phuoc Diem commune, and among poor

hamlets of Ninh Phuoc rural district although Phuoc Diem is not poor coomune of the district.

- ***Vinh Truong hamlet***

Vinh Truong is considered the poorest hamlet in the commune with 58 poor households out of total 94 ones. As much as 5% children at school age do not go to school. No one has unversity degree, and there are only 3 high-school pupils. Illiteracy rate of adult remains high. Most poor households are in this hamlet.

2.2. Key livelihoods and capacity of income diversification:

a) Thuong Diem hamlet:

- ***Livelihoods of women in Thuong Diem hamlet***

Order		Description	Analysis
No	Livelihood		
1	**Doing paid works**	- It is considered as key livelihood of women in Thuong Diem hamlet. Major hired works include loading baskets of fish by hand, dry fish for 50 owners of fish kilns in commune (approximately over 500 women work for these owners), working for salt making factory in commune. - Normally, price of hired labor is about 25,000 VND/day. Manual loading fish baskets is paid by tonne, basket (this work is paid higher but harder). Price of hired labor is 2,000VND/basket/30 kilogram with a distance of 100-200 meters from the seaside, and as per seasonal work of about 4 months per year. Dry fish is a seasonal work with about 25,000VND/day. - Paid labor outside (in other provinces): monthly salary of about 500-700 thousand VND (including food).	*Advantages*: - No need of capital (money) - Jobs are available in seasonal time. *Difficulties*: - Seasonal and unstable works - Many works are hard and not suitable with women' health. *Solutions/recommendations*: - Training on vocational guidance, finding out other more sustainable, stable livelihoods such as (i) fishery aquaculture, (ii) processing fish sauce, (iii) breeding cattle and other livelihoods in more suitability with capacity of women and making the best of available natural resources in the locality. - Support to mobilize capital and training on vocational guidance.
2	**Small business**	It is ordered as the second source of income for local women. Small businesses are grocery business, fish business and other in-community small business.	*Advantages*: - Little capital - mobile *Difficulties*: - Irregular

		Daily income is about 20-25 thousand VND.	- Unstable. *Solutions*: don't encourage development of this livelihood.
3	**Pigs Breeding**	- It is also an important livelihood of women, especially poor households. - Many households raised pigs with scale of over 10 porkers per year. There are efficient breeding models, for example, Ms Lương Thị Cùm breeds three months /herd, three herds/year x 40 pigs with 70 kilogram/pig, so that she gains average profit of 200 thousand/pig. Hence, her average income is about VND12-15 million /year.	*Advantages*: - Not much capital - Many women has much experience of it - Available labor *Difficulties*: - Limited breeding technics - Many women are so poor that do not having enough capital. *Solutions*: - Support to mobilize capital for poor women by providing experiences and technical assistance.
4	**Kappaphycus alveresii farming**	- This new livelihood has just occured in recent time (see Annex). Some women has carried out kappaphycus alveresii farming for four years. - They gained good results for the first year due to favorable climate, without rain and flood. With total capital of VND 2 million , they got profit of over VND 2 million after three months of aquaculture. - Then, due to flood, salt water waste, water waste from steamed fish, kappaphycus alveresii died. Hence, some women exhausted capital and had to leave work. - Till now, there are many unrestored spaces with about 200 households, in which have at least 4-5 perches or several hectares per household. - Currently, some households have carried out kappaphycus alveresii farming in seabed, not in ponds. Aquaculture in seabed requires much more capital. Approximately 185 households had 70 hectares of aquaculture in	*Advantages*: - Not much capital, mobilization of partipation of poor households. - Not high technical requirements. - Some fishmen have experience of it - Good consumption market. *Difficulties*: - In shortage of capital for poor households. - Such high risks as: flood, storm, being food of fish, polluted environment. - Not much experience of preservation after harvest. *Solutions/recommendations*: - Mobilize capital for poor households. - Promote model of in-cage kappaphycus alveresii farming to overcome risks (see Annex on model of in-cage aquaculture of kappaphycus alveresii) - Technical assistance and providing experience of kappaphycus alveresii aquaculture, preservation after

		2003. - This Community said that aquaculture planning of 150 hectare coast has been submitted to Department of Fishery but not approved due to tourism planning and coral protected area.	harvest (may be invested more in bamboo trellis for drying kappaphycus alveresii, according to Department of Fishery's staff)
5	**Others**	For other livelihoods such as sewing, fishing kappaphycus alveresii out of the water, diving for shrimp, burning coal, processing fish sauce, etc, only a few of women do but not frequently. Some works are very hard such as burning coal but hired labors just have enough for food.	- Labors just do these very hard works when they have no choice. - Do not encourage development of this livelihood.

(Source: *Outputs of discussion with Group of Woman in Thuong Diem hamlet*)

- ***Livelihoods of man in Thuong Diem community***:

Order		**Description**	**Analysis**
No	Livelihood		
1	**Doing hired works**	- It is also considered as key livelihood of men in community. Major hired works are as follows: (i) capture/exploitation of fish for boat owners in other hamlets (approximately 400 boat owners in commune), (ii) working for salt making factory in commune, (ii) breeding cattle for some households, (iv) in-cage aquaculture of shrimp/fish. - Income is paid by volume of hired works. For example: (i) breeding buffalo and cow is often paid with one-year package wages (about VND10-15 million /herd of over 100 ones), (ii) aquaculture of seed shrimps/product shrimps is paid as per % of owners'	*Advantages*: - No need of capital (money) - Jobs are available in seasonal time. - They have capacity of capture and aquaculture of seed shrimps. *Difficulties*: - Seasonal, unstable and irregular works. *Solutions/recommendations*: - Such hired works as capture, aquaculture of fishery and breeding cattle is suitable to capacity of local men. However, due to shortage of capital and their existence, they has to do hired works. Thus, mobilizing capital and training on vocational guidance for poor households to self-establish Group of poor fishmen/farmers who are specialize in capture of fish, aquaculture of fisher, breeding cattle are wishes of Group of Men in Thuong Diem

		turnover plus basic wages (normally VND 600 thousand /person/month).	hamlet.
2	**Processing fish sauce**	Only a few of households have been doing this works and man plays important role in collecting inputs, processing technics, consumption market. Poor households don't take part in this activity.	*Advantages*: Traditional occupation. *Difficulties*: - Consumption markets - Selling price. - Haven't develop commercial name *Solutions/recommendations*: Mobilize capital for poor households to take part in this activity.
3	**Breeding cattle**	Mainly bred cattle are cow, sheep, goat. Some households with a large breeding scale of 30-40 ones which are maily well-off ones make the best of their families' labors (mainly men) and hire labors of poor families (mainly men). There is competition of hiring labors among breeding-farm owners. Chance of taking this livelihood for poor persons is very little.	*Advantages*: - Having potential of breeding area (pasture) - Available labors *Difficulties*: - Limited breeding technics - Unstable markets. *Solutions*: - Maybe support with capital for poor households to breed sheeps in order to increase their income
4	**Fishery Aquaculture**	This livelihood is developed in recent time and are mainly done by some well-off households. Seed shrimp and product shrimp are main kinds of fishery aquaculture. In the whole commune (some in hamlets), there are 65 hectares of product shrimp aquaculture of 50 households (private owners) with 130 hired labors, 110 seed shrimp hatcheries of 33 households with 250 hired labors. Poor households couldn't self-organize this activity but only take a chance of working for well-off households.	*Advantages*: - Potentials of land, water surface and natural conditions. - Have had experienced in fishery aquaculture. *Difficulties*: - Due to high investment, poor households don't have chance. - Such high risks as storm, flood, being food of fish, polluted environment make shrimps died. - Don't take advantage in consumption markets. *Solutions:* - Support to/training in technics of fishery aquaculture, doing marketing activities for households of shrimp aquaculture.
5	**Fishery**	Only 16 households/398 ones	*Advantages*:

	Capture	could self-organize onshore fishery capture by small boats and tools of onshore capture. This livelihood doesn't create considerable income as much as other livelihood in hamlet. Poor households only take part in hired aquaculture for other hamlets.	- Little capital. - Have had experience of it. *Difficulties*: Violate Fisheries Law. *Solutions/recommendations*: Support poor households to sell ships for off-shore capture (as per method of coorperation).

(Source: *Outputs of discussion with Group of Woman-Man in Thuong Diem hamlet*)

b) Vinh Truong hamlet:

- ***Livelihoods of women in Vinh Truong community:***

Activities of making money of women in Vinh Truong community are as follows: (i) Scraping seaweed (about two months/year), (ii) Fishing "mo" seaweed out of the water (about two months/year), (iii) Diving for sea snails, (iv) hired works such as backing up shripm ponds, picking coffee in Lam Dong, working as family helpers in Ho Chi Minh city, (v) Diving for shrimp (one month/year), (v) Kappaphycus alveresii farming, (vi) Small businesses, (vii) breeding sheep, cows (not goats), pigs, and (viii) others. Nevertheless, livelihoods of women in Vinh Truong community are ordered as per their contribution of income as follows:

Order		**Description**	**Analysis**
No	Livelihood		
1	**Scraping seaweed**	- It is ordered as the main livelihood of women in hamlet. Seaweed which is a kind of sea plants could be very good food. - Income from scraping seaweed is from 10,000 to VND15,000/person/day. Time of taking part in this activity is from November this year to March next year (five months/year).	*Advantages*: - No need of capital (money) - Available sources of seaweed - Available sources of *"mo"* seaweed - Available sources of sea snails - Available water surfaces for fishery aquaculture *Difficulties*: - Seasonal works - Low income - Unstable selling price -Hard works for health of women. - Women have no experience of fishery aquaculture (especially kappaphycus alveresii). *Solutions/recommendations*: - Vocational guidance, find out
2	**Fishing *"mo"* seaweed out of the water**	It is considered as the second source of income for local women (for about three months/year from February to April). Income is about VND 20,000/person/day.	

3	**Diving for sea snails**	This is an important livelihood of women, especially poor households. It could be done all year. However, income is very irregular and unstable.	other more sustainable, stable livelihoods such as (i) fishery aquaculture, (ii) processing fish sauce, (iii) breeding cattle and other livelihoods more suitable to the capacity of women and making the best of available natural resources in the locality. - Support to mobilize capital and training on vocational guidance for poor households; - Livelihood of kappaphycus alveresii farming could be developed in this hamlet. Other hamlets have much experienced in it. Model of in-cage kappaphycus alveresii farming to overcome risks should be promoted in the community (see annex on model of in-cage kappaphycus alveresii aquaculture). - Providing technical assistance and experiences of kappaphycus alveresii farming and preservation after harvest (may be invested more in bamboo trellis for drying kappaphycus alveresii to air, according to idea of Department of Fishery's staff)
4	**Doing hired works**	- Some works as helper for shripm ponds (with VND 25,000 /day);coffee harvest (with VND 30,000/day), working as family helpers (with 400,000VND/month), manual loading of fish baskets and others in commune.	
5	**Others**	Like small businesses, kappaphycus alveresii aquaculture, diving for shrimp, processing fish sauce, etc have been done by a few of women and irregular works. Activity of kappaphycus alveresii farming is only initially deployed. Women in Vinh Truong hamlet have not implemented bravely this activity.	

(Source: *Outputs of discussion with Group of Woman in Vinh Truong hamlet*)

- ***Livelihoods of Man in Vinh Truong community*:**

Activities of making money of men are as follows: (i) Diving for shrimp, (ii) Onshore capture (by *màn* nets, *rạng* nets), (iii) Breeding cows, sheep, (iv) doing hired works, and others (such as cultivating, processing fish sauce, kappaphycus alveresii aquaculture, etc). According to capacity of making money, livelihoods are clarified as follows:

Order		**Description**	**Analysis**
No	Livelihood		
1	**Diving for lobster**	- It is considered as main livelihood of men in the community. Time spend on this activity is normally from November this year to February next year. - Income from this activity is	<u>*Advantages*</u>: - No need of capital (money) - Rather available sources of shrimp. - High selling price, high income. <u>*Difficulties*</u>: - Seasonal works,

		rather high due to very high selling price of lobster. Normally, income is about 50,000-100,000VND/person/day.	- Requires good health. *Solutions/recommendations*: - Support to equipment of diving cloths, - Training on Fishery Law
2	**Onshore capture (by using *rạng*-nets and *màn*-nets)**	It is the livelihood of most fisherman households in hamlet. They just equiped small ships, coracles and tools of onshore aquaculture. This activity could be done all the year. Nevertheless, income from onshore aquaculture is very low, with only VND 10,000/person/day.	*Advantages*: Traditional occupation *Difficulties*: Low income Violate current regulations on fishery capture of the State. *Solutions/recommendations*: Funding for poor household in other livelihood activity such as aquaculture, breeding.
3	**Breeding cattle**	Main cattle are cow and sheep. The hamlet has number of cows and sheep with nearly 500 heads. Some households with a large breeding scale of 20-100 ones are mainly few well-off ones. Poor households without capital couldn't access this livelihood.	*Advantages*: - Available space for breeding - Available labors *Difficulties*: - Unstable selling price and consumption markets. - Low efficiency. *Solutions/recommendations*: - Support with capital for some poor households to raise sheep to increase their income. - Training on breeding technics.
4	**Others**	Others including kappaphycus alveresii aquaculture, planting forestry trees, processing seafood (fish sauce), hired fishery capture, etc are unstable and done by few households.	*Solutions/recommendations*: Support capital for poor households to promote kappaphycus alveresii aquaculture.

(Source: *Outputs of discussion with Group of Woman-Man in Vinh Truong hamlet*)

2.3. Impacts of market on community livelihoods:

In the context of Thuong Diem and Vinh Truong hamlets in particular, Phuoc Diem an Phuoc Dinh commune in general, elements of market has not affect livelihoods of communities, especially poor fishermen. Some above mentioned key livelihoods such as kappaphycus alveresii farming are affected by elements of market. Till now, there has not been any noticeable issue of market share and selling price. However, market has great impacts on income from breeding cattle (such as sheep, cow, sheep). While breeding sheep, cow and goat is currently considered as an advantage of Ninh Phuoc province in general, selling price is irregular, leading to the fact that many households have to change selling price of seeds.

2.4. Support organizations for poor households in communities

a) *Thuong Diem hamlet*:

Outputs of Discussion Group and meeting with habitants in Thuong Diem hamlet show that till now local people have not benefited from any hunger eradication and poverty alleviation project for only poor fishermen in the hamlet. Some projects relating to community (Phuoc Diem commune in general) that local people know are as follows:

- Project of fishing ports expansion (invested by the Government and investment from MOFI VND 30 billion);
- WVI has supported to overcome difficulties with 250 tanks of filtered water, sixty 300-litter water tanks, 20 water-spouts, 22 million works for poor persons such as working for roadworks, working as cleaners in Environment Cleaning Week (with corresponding income of 30,000 and 40,000VND/day);
- Support of an American organization (CPI) to food aid in Central coastal Region's flood;
- Support of Canada government by providing loan to poor women to build up toilets. The total of 130 toilets with total capital of 130 million VND (one million VND/toilet), with loan interest of 0.4 % /month and loan duration of 12 months. Till now, women have refunded VND 80 million and completed establishment of 80 toilets. They will complete establishment of 50 toilets in 2006.
- ADB is carrying out survey to invest in water supply and drainage system in Phuoc Diem. This project belong to Program of 8 towns all over the country and was approved by PPC. Total of estimated capital for the commune is about 2 million USD. This project is in process of survey without appraisal.

b) *Vinh Truong hamlet*:

Outputs of Discussion Group and meeting with habitants in Vinh Truong hamlet show that currently Vinh Truong hamlet has benefited from one project that local people know. Particularly:

- Project of Action Aid Viet nam (AAV) with its objective of supporting poor households through such activities as: (i) Food Security including encouraging agricultural expansion through training on technics of kappaphycus alveresii aquaculture, fishery aquaculture (shrimp, fish); organizing clubs of agricultural extension on breeding and planting; credit activities such as establishment of credit fund in commune, supporting fund, etc; (ii) Education: support through providing scholarship, rewarding and establishment of common bookcases to poor pupils; (iii) Health and environmental hygiene: support to build well, support to medical clinics by providing beds, build foundation of medical clinics, water ponds in medical clinics, support to lonely old people by providing free medicine); (iv) preventing natural calamity, family violence, HIV/AIDS.
- Project of Global Environmental Protection (invested by the Government): to establish Team of Self-Protecting Sea corals of six persons with allowance of 200,000VND/person/month).

- Community Based Infrastructure Project (Project CBRIP) with total capital of VND 900 million for the commune from 2005 to 2007. The main objective is to support to small infrastructure for the commune with 5% local contributution, participation of local people in selection of construction works, comments on design, establishment and management of construction works. Some construction works selected by local people are community house, kindergarten, teacher house, village road. Proposal is in appraisal process.
- Project of *bãi ngang* area with the total State investment of VND 500 million /year with district as investor has been implemented from 2004 to 2007. The project has invested in construction of a 6-storey secondary school with total cost of VND 850 million . And one medical clinic of the commune will be built with total cost of VND 407 million .

2.5. Possibility for the poor to access fishery benefits

a) *Thuong Diem hamlet*:

Findings from group discussion in Thuong Diem hamlet reflected limited possibilities for the poor to access fishery benefits.

- *For offshore catching:* Require high investment, no person in the hamlet becomes owner of offshore boat, poor people only work for others.
- *For onshore catching:* Only 16/398 households in Thuong Diem can afford small boats and onshore catching tools. However, this source is not encouraged according to Law on Fishery.
- *For salt production:* Though Thuong Diem is the foundation of industrial salt manufacture (raw salt) with large area of salt fields, this benefit source is currently exploited by State factory. About 165 laborers of Thuong Diem are employed by the factory. Yet, the poor cannot access this benefit, even indirectly.
- *Aquaculture:* Thuong Diem does not have great potential of surface area for aquaculture. Some households, including the poor, have access this benefit, but they do not have actual ownership of water surface as State Salt Factory does.
- *Other benefits:* The poor in Thuong Diem cannot access grazing field as well as area for aquaculture.

b) *Vinh Truong hamlet:*

Findings from group discussion in Vinh Truong hamlet, like in Thuong Diem, reflected limited possibilities for the poor to access fishery benefits.

- *For offshore catching:* Require high investment, no person in the hamlet becomes owner of offshore boat, some work for other hamlets or for Phuoc Diem commune.
- *For onshore catching:* Most households can afford coracles and onshore catching tools. However, this source is not encouraged according to Law on Fisheries.
- *Aquaculture*: The hamlet has rather great potential of surface area for aquaculture. It is estaimated that Vinh Truong has more than 100 ha for aquaculture and Kappaphycus alvaresii farming. However, it has not been exploited thoroughly in

Vinh Truong. Few households have access to raise Kappaphycus alvaresii, but at very small scale and failed as fish eat Kappaphycus alvaresii.

- *Other benefits:* The poor cannot afford to raise cattle as it requires high investment.

3. Conclusion and Recommendation:

- It is reasonable to select Ninh Thuan for prefeasibility study for poor fishermen support project.
- It is also reasonable to select Ninh Phuoc, one of two poor coastal districts in Ninh Thuan. However, if more fund provided, the survey should cover also Ninh Hai district, a poor district, in which Vinh Hai is a coastal commune with several difficulties.
- Of Phuoc Diem and Phuoc Dinh communes: only Phuoc Dinh is among 157 coastal poor communes according to poverty line. However, if limited survey selection to one district (with 2 communes), it becomes unsatisfactory as the third coastal commune of An Hai has obmitted its coastal benefits which are occupied by State factories and companies.
- Of two selected hamlets Thuong Diem and Vinh Truong: these are actually very poor hamlets (though Thuong Diem is not in a poor commune). Findings showed that feasibility study could be continued for project formulation.
- Based on analysis as well as observation by fishermen communities and officials on direct and indirect issue in fishery management, a number of activities may be further studied to incorporated in project proposal, namely: (i) Management capacity strengthening for fishery officials at provincial and district level (through trainings to improve management capacity and techniques); (ii) Raising awareness for fisherman community about livelihoods, Law on Fisheries, State guidelines on fishery development and some techniques and knowledge concerning exploitation and aquaculture (through trainings); (iii) Support to pilot demonstration of Kappaphycus alvaresii farming in cages (see attached pilot report) in surveyed hamlets (most feasible in Vinh Truong); (iv) further study on raising sheep, goat, and cow in Thuong Diem hamlet; (v) Further study on support to poor group in Thuong Diem with grace credit to purchase catching tools in cooperation form.

VIETNAM

ENGAGEMENT OF POOR FISHING COMMUNITIES IN THE IDENTIFICATION OF RESOURCE MANAGEMENT AND INVESTMENT NEEDS

TRA VINH PROVINCE

I. INTRODUCTION OF RESEARCH

1. Objectives:

- Assess financial resource to develop aquaculture in Tra Vinh province.
- Identify sustainable livelihoods of fishers, especially poor ones.
- Identify solutions to develop aquaculture and preserve the environment, creating employment – stable incomes for fishers.

2. Methodology and research site

Organised semi-oriented seminar with all-level authorities and related agencies.

Data used in this research included primary data collected directly through seminars, group discussions, community consultation with people's participation. Secondary data is collected from statistics, synthesized reports on economic development of the province/district/commune in 2001- 2005, report on HEPR programme, planning for aquaculture development in 2006 –2010.

Research team conducted survey in 2 communes in Cau Ngang district, which is one of the poorest ones of Tra Vinh province. Two selected communes are My Long Nam and Hiep My Dong which are poor, located in coastal area with a great number of Khmer ethnic people. In each commune, seminars were carried out with authorities and such mass organisations as Famers' Union, Women's Union. Two group dicussions were organised in 2 villages of each commune, in the first village 10-12 poor women were selected, in the 2nd village 10-12 households were selected to represent for 3 groups of poor, average and rich and both male and female.

In each selected village, discussion was in coordination with village leaders and women union. In order to ensure objective information collection, poor households were random selected maximize people's participation in discussions, people were allowed to raise their voices and propose solutions. During dicussions, people analyzed household economy and study in-depth the causes of obstacles in different livelihood aspects.

Table 1. Techniques used in the research

Techniques	Purposes
1. Analysis of secondary data	To collect and analyse information about society, economy, human resource, local socio-economic development, strategy for growth and poverty reduction, planning reports, reports of implemented project relating to the poor and protecting source aquatic product.
2. Semi-oriented seminars (flexible)	To collect and analyse information from community (province, district, commune) about real situation of

	employment, income, obstacles, local needs and solutions. To set target for assisting programme for the poor in coastal area and aquatic products resources management
3. Group discussion	To collect and analyse information from community (households, village leaders) about real situation of employment, income, obstacles, local needs and solutions in order to identify eligible and sustainable types of livelihoods for coastal inhabitants in general and for the poor in particular.
4. Priority ranking	To define the importance of obstacles and essential need of the poor, priority order set by community
5. Issue tree	To analyse eligiblity of sustainable livelihood approach to ensure the poor's participation
6. Solution tree	To identify the role of pro-poor policy in order to ensure employment and stable income, as well as aquatic products resource management
7. Analysing household economy	To analyze economic activities of some households to survey main activities, labour useage, capital, land, cost and income, obstacles, proposals and solutions for sustainable livelihood activities for the poor
8. Taking photograph, visiting places of industrial aquaculture	To assess effectiveness, analyze experiences to identify eligible and sustainable forms of aquaculture in coastal area.

II. GENERAL INFORMATION

1. Socio-economic situation of Tra Vinh province 2001 – 2005 [23]

1. 1. Geographic and natural conditions

Tra Vinh is a province located in the Mekong river Delta; The geographic co-ordinates are: 9°31'46'' - 10°04'5" N and 105°57'16" - 106°36'04" E. It has border with Vinh Long province in the northwest. It has eastern border with Ben Tre by Co Chien river. In the west, it borders Soc Trang province by Hau river. In the southeast, it borders the Pacific Ocean - with the coastline of over 65 km. Provincial centre is on National highway No.53, 200 km from Ho Chi Minh city and 100 km from Can Tho city. Total natural area is 2,225 km^2, accounted for 5.63% of the Mekong river Delta area and 0.67% of national area. Tra Vinh has 7 districts and one town with 102 communes and wards.

[23] [23] Source: Draft report of provincial socio economic situation in 5 years periods 2001-2005

Figure 1: Natural geographic map of Tra Vinh province

The province is divided into 3 ecological zones: (i) Fresh water zone includes Cau Ke District and part of Tieu Can and Cang Long Districts; (ii) Sea water zone includes Cau Ngang District, part of Tra Cu and Chau Thanh Districts (iii) The rest consists of the whole Duyen Hai District, coastal communes of Cau Ngang district and Long Hoa commune. Chau Thanh District is fresh or sea water zone depending on season.

1.2. Population

In 2005, Tra Vinh has the population of 1,028 millions. Women occupies over 51% of the population; 85.66% live in the rural, 14.33% live in the urban, and nearly 30% of the population is the Khmer. 43.2% the population are Buddhists, 6% are Catholics.

1.3. Human resource

In 2005, Tra Vinh has more than 800 thousands laborers, accounting for 80% total population, laborers in economic sector is, however, only 550 thousand people, nearly 70% of labor force, 80% of them get usual jobs, about 20% are underemployed or unemployed. More than 80% labor force work in agricultural sector (including forestry and aquaculture) in rural area.

1.4 GDP stably increases in all sectors.

GDP growth rate in the period of 2000 - 2005 is over 10%, higher than the average rate of the whole country.

Gross product growth and growth rate (according to the price in 2004)

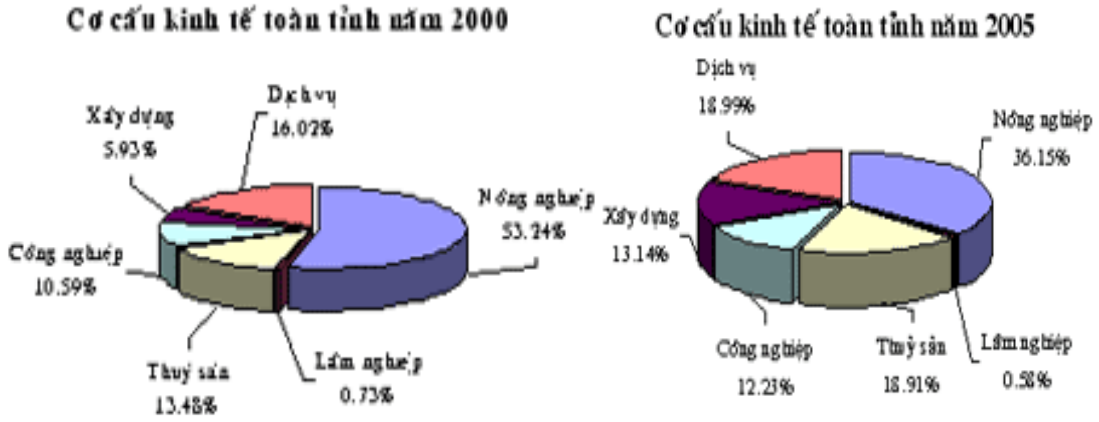
Unit: 1000 billion VND

Year	2000	2001	2002	2003	2004	2005
Service	0.63	0.67	0.72	0.79	0.98	1.365
Industry - Building	0.20	0.22	0.26	0.33	0.39	0.898
Agriculture - Forestry - Fishery production	1.95	2.10	2.30	2.50	2.70	2.845
Total	2.78	2.99	3.28	3.62	4.07	5.1

Growth rate	108.90	107.30	109.70	110.50	111.30	111.5

1.5. Economic structure moves towards descending rate of agriculture from 54.32% in 2000 to 39.60% in 2005; sea product increased from 10.91% to 16.26%; industry increased from 8.25% to 10%; building raised from 3.35% to 7.50%; service from 21.82% to 25.60%.

Figure 2: Economic structure between 2000 and 2005

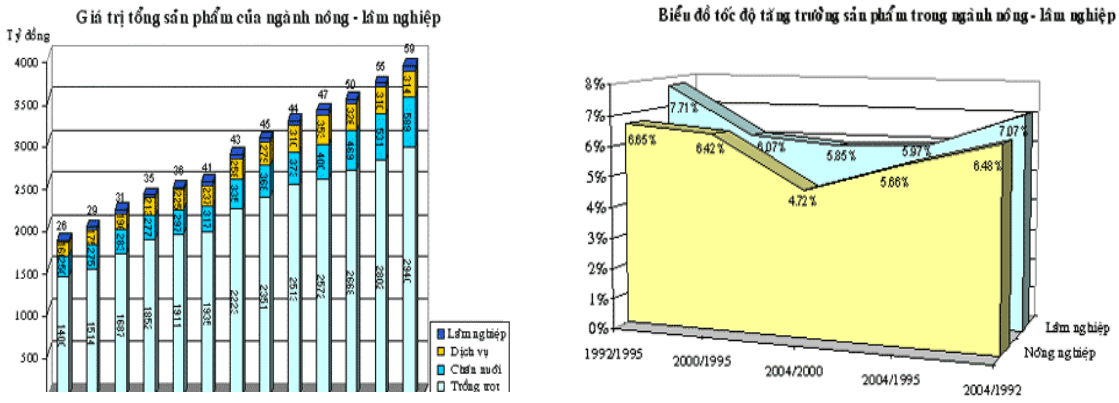


Economic structure (%)

Year	Agriculture	Forestry	Fishery production	Industry	Service	Building	Total
2005	36.2	0.5	18.9	12.2	19	13.2	100
2004	40.2	0.6	17.8	11.9	17.1	11.6	100
2000	53.3	0.7	13.5	10.5	16	6	100

*1.6. Agriculture production (*including aquatic product and forestry) plays the most important role in the province's economy, counted for more than 50% of the GDP. The value of agriculture and forestry in 2004 was 3,902 billion VND (in which, agricultural was 3,843 billion VND, forestry was 59 billion VND), increased by 2,066 billion VND in comparison with that of 1992. The average annual growth rate in the period of 1992 - 2004 in agriculture was 6.48%, forestry was 7.07%.

Figure 3: Gross product and growth rate of agriculture and forestry



1.7. Fishery and aquatic products:

The average output value of Fishery sector of Tra Vinh increases by 13.69% per annum. Aquaculture is strongly developed in sea water zone; area used for aquaculture increased 15,000 ha; production qualification improved; models of effectively raising sugpo and green clawed shrimps developed. Aquaculture revenue in 2000 was estimated to grow by 2.7 times more than 1995's. About 7000 - 8000 households involved in raising shrimps. Aquaculture service was much improved. The province invested in upgrade and building new cultivating camps for breeding shrimps and fish, attraction and transfer of technique. They were successful in experimentally cultivating varieties of sugpo shrimps, clawed shrimps, unisex tilapias, gobies, etc. Tra Vinh is developing the service of supplying industrial fresh food for shrimps and craps; expanding the service of fixing water pumps and dredging pods and lakes for raising shrimps.

1.8. Industry and construction:

The share of industry and construction rose from 16% in 2000 to 25% in 2005. Industrial production revenue growth rate is rather high during the period of 2000 - 2005. Main industry is manufacturing, especially aquatic, sea products and chemical manufacturing.

1.9. Trade and tourism has evident changes.

The social market has been expanded; the merchandise circulation has met the production and social life demands more. Total retail revenue is continuously raised over the years. In 1999, it reached 612.44 billion VND; 1995 1,564.36 billion VND; 1996 2,103 billion VND; 2003 3,115 billion, accomplished 97.34% of year's target, and increased by 12.01% as compared to 2002. Main force in retailing circulation is non-state sector and private workers, making up 94-96% of the total volume of merchandise retailing circulation.

1.10. The export revenue in past years has not been adequate to the province's potential.

The reason is that exports of the province are mainly preliminarily manufactured commodities and undiversified. 2003 export revenue was USD 39.512 million, expected to reach USD 46 million in 2004. Beside main commodities as various kinds of rice, frozen aquatic and sea products, coconut ladle, other exported goods were fishes, oysters, fired fishes, dry-scraped coconut boiled rice. Export value was estimated to be 6.5 million USD, fulfilled the given plan, and increased by 78.92%. Besides, main imports were devices for production and raw materials for medicine production. Enterprises have always been interested in export markets. At present, the merchandise of Tra Vinh are exported to such countries as: the United States of American, Japan, China, Australia, Korea, Taiwan, Hong Kong, Poland, Switzerland, People Democratic Republic of Korea, the Netherlands, France, Cambodia, Singapore, the Republic of Czech, Sweden, etc

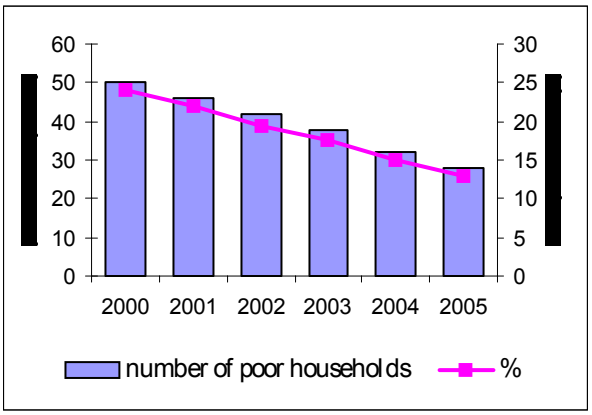
2. Poverty and provincial poverty reduction strategy[24]

2.1. Poverty in the period of 2000-2005

Figure 4: Poverty in the period of 2000-2005

2.1. Poverty in the period of 2000-2005

Rate of poor households and number of poor households (according to old poverty line) decreased rapidly during 2001 - 2005, from nearly 50% in 2000 to 13% in 2005.



According to surver results on poor households in 2005 under new poverty line, there are 70,045 poor household in the whole province currently, 32,186 of which are from Kh.mer ethnic group (counted for 15.02%) and 42 extremely poor communes eligible for Decree No. 135/CP program.

Figure 3: Poverty breakdown by districts, towns

District/Town	Total no. of households	No. of poor households	Rate (%)	Khmer poor households	District/Town	Total no. of households
102	**Whole province**	**214,188**	**70,035**	**32.70**	**32,186**	**42**
15	**Cau Ngang District**	**28,095**	**9,741**	**34.67**	**4,789**	**28,095**
10	Tra Vinh Town	18,605	2,790	15.00	556	18,605
14	Chau Thanh District	30,032	9,772	32.54	4,858	30,032
10	Duyen Hai District	19,408	5,816	29.97	2,364	19,408
11	Cau Ke District	25,421	7,888	31.03	3,096	25,421
11	Tieu Can District	22,547	6,837	30.32	2,489	22,547
14	Cang Long District	32,520	9,245	28.43	1,056	32,520
17	Tra Cu District	37,560	17,946	47.78	12,978	37,560

**** Poverty features***: After nearly 20 years of *doi moi* process, incomes and living standard of most people has improved, thus, poverty features has changed as well, in the past food shortage(needs for food and warmth) has basically been solved, at the current time and in coming years, it is the non-food poverty (need for housing, healthcare, education, transport

[24]Draft provincial poverty reduction program till 2010

and communication); the widening gap between the rich and the poor, access to achievements of development remain unequal between the rich and the poor.

**** Variety of poverty in the province:***

- Unsettled housing (about 16,311 HHs), without durable assets, no or low-value furniture. Assets of most people from Khmer ethnic group are less than 2 million VND.

- Lack of electricity and clean water.

- Lack of farming land and building land (according to survey results in Aug 2004,in the whole province, 12,348 HHs have no land for production, 1,427 HHs have less than 1,000m^2 farming land, 4,508 HHs have between 1,000 and 3,000m^2 farming land)*

- Lack of conditions for production such as manual tools, capital, and no market survey for products.

- Lack of production knowledge (over 70% of poor HHs) due to poor education or illiteracy, no technical level (about 86.32% of poor HHs), mainly in agriculture, forestry and aquaculture.

- Children have to drop out of school early (most children do not complete primary school) especially girls, sickness without medical care, out-of-date production and living.

- Besides, group of marginalized poor people like isolated the old, the disabled is out of HEPR programme.

Causes of poverty

Objective causes:

- Due to the fact that the province is in the remote area with the system of interlacing rivers and canals, separated from roads, underdeveloped economy, the majority of farming lands are aluminiferous or salty, production is merely in agriculture with low productivity, underdeveloped infrastructure, regularly faced with natural diseases and epidemics, resulting in consecutive crop failure.

- Merchandise market supplied the inputs and outputs are often changeable towards the adverse tendency for those who rely on agricultural production. Especially unstable prices of farm produce and foodstuff, aquatic products cause serious loss to producers, particularly the poor

- Population growth rate remains high, unemployment and underemployment pressure is increasing, untrained laborers occupies over 90% of total work force.

- Awareness of local authorities on hunger eradication and poverty reduction are not profound. They have not entirely seen the importance of hunger eradication and poverty reduction as well as job creation in the process of socio - economic development at localities. Therefore, there is lack of active directions.

- Low - interest rate credit provision are among the important resources helping poor households but they have limited access to these credit because most of them lack of knowledge, afraid of difficulty and the control of credit organizations over capital use. Social high interest rate credit is the main resource used by the poor because of its accessibility.

* Above data is poor Khmer households

***S*ubjective causes:**

- Low education, insufficient production knowledge and experience, lack of technical and scientific information, land, awareness of self-better in life, seriously relying on helps government and community subsidy. Drawback customs also make an adverse impact on production and life resulting in waste in production and consumption, laziness, risks and incapability to work due to illness and diseases.

- Lack of production land.

- Lack of capital to invest in household economic development

- Large number of children, few laborers, large number of interdependent people.

- Lack of laborers.

- Lack of production knowledge and experience.

- Accidents, risks, often suffering from illness and diseases.

- Member of the family are social evil incidences

- Unavoidable causes

Poverty trend

Poverty mainly in rural areas: Among the total number of poor HHs in the province, 93.11% were from 7 districts, only 6.88% in towns. Only in 4 districts of Trà Cú, Cầu Ngang, Châu Thành, Càng Long (agricultural, harsh natural conditions, underdeveloped economy), number of poor HHs in 2005 is 53,646 HHs, counted for 63.74% the provincial number.

Particularly 2 districts of Trà Cú, Cầu Ngang have the highest poverty rate in the province. In 1998, poverty rates of Cầu Ngang, Trà Cú are respectively 26.2 – 31.1%/ 24.44% (of the province); in 2001: 28.8 – 27.1/22,4% (of the province) and in 2005: 41.00%-41.32%/35.89% (of the province) , in which Trà Cú district have the highest number of poor HHs and the highest poverty rate in the province; in 2005 on the whole district, there are 15,651 poor HHs, accounted for nearly 18.59% poor HHs in the province.

Poverty mainly in areas of great Khmer ethnic population: due to old customs, Khmer people often live alongside pagodas, along the sandy-banks, where benefits in cultivation and breeding is poor, low income from production, thus, people's life is always in difficult. According to 2003 survey , rate of Khmer HHs is 31.8% of the provincial total number, but number of poor HHs among Khmer ethnic is responsible for 38.8%; in all districts, Khmer HHs poverty rate is higher than the average poverty rate in the district, like Cầu Kè, rate of Khmer HHs is 31.4% of the total number, but rate of Khmer poor HHs is 62.9%. Similarly, in Tiểu Cần district it is respectively 32% and 38%, Trà Cú: 59.3% and 68.6%, Duyên Hải: 16.9% and 34.56% etc. Trà Cú as mentioned above is the district has the highest poverty rate in the province, and also where most of Khmer ppopulation lived (20,955 HHs counted for 32% Khmer population in the area).

Poverty incidence are common in extremely poor communes: There are 102 communes and towns in the whole province, 38 of which are extremely poor communes (Trà Cú alone 10 communes) eligible for 135 Programme, counted for 40% communes and wards in the province, however, number of poor HHs in 2003 (according to statistical report of Provincial Ethnic Committee) accounts for 62% the poor HHs in the whole province (24,677 HHs in which Khmer ethnic have 14,673 HHs, counted for about 60% of poor HHs in extremely communes). On the average, rate of poor HHs in this area is 26.7%, which is nearly 7% higher than average rate of poor HHs on the whole province (17.45%). In which, number of communes with poverty rate less than 30% is 7 communes, between 30-40%: 9 communes and over 40%: 2 communes (Trường Thọ, Cầu Ngang have poverty rate of 44.5% and Đa Lộc, Châu Thành: 46.5%). Hence, nearly two third of poor HHs in the area are in extremely poor commune.

Results of HEPR programmes

From 2001-2005 135 Programme built 343 infrastructure works for 42 poor communes, funded houses for 24,132 poor HHs, pooling VND 76,318 million from community and inside – outside organisations, provided 35,114 credits without interest for poor participants; Mobilizing 2,832,122 working days and VND 40,037 million from people's contributions to build irrigating works and rural roads; Organized 3,060 training courses on production skills for 113,349 participations, organised 104 worshops with 6,210 participants ; Organised 106 trainning courses on skills of HEPR for grassroots staffs with 3,079 participants;

Stabilized and formed new economic areas in poor communes: From 1996-2004 in Tra Vinh province, 7 projects in New economy programme has been carried out, in 4 coastal districts, including: Châu Thành (1 project), Cầu Ngang (1 project), Trà Cú (1 project) and Duyên Hải (4 projects), expected to expand 8,018. ha fallow land, estimated number of beneficial HHs is 3,962 HHs and total budget 84,550 million vnd.

Beside state policies and projects under Resolution No. 135, poor communes receive direct assistance from agencies, enterprises, according to reports from 1999-2003, agencies, enterprises provided poor communes VND 544 million, in which, credit for cow raising 163 million dong, mobilised 132 community working days to repair roads, supplied 250 school bags, 1222 notebooks, 512 books, 444 pens, planted 5.000 trees, repared 94 houses for the poor. Besides, pro-poor policies in healthcare, education were implemented.

In general, above projects results in practical outputs of production expansion, living condition stablised, better spiritual and material life for direct beneficiaries and people in the targeted area.

2.2. Poverty status in 2006: According to the latest figures, in early 2006, there are over 70 thousand poor HHs in the province, counted for 33% of the total number of household, in which nearly 50% poor HHs are Khmer ethnic people. Trµ Vinh are among the highest poverty rated province in the country.

2.3. Poverty reduction targets till 2010: Reduce poverty rate from over 32% by 2005 to 20% by 2010, within 5 years decreases 37,000 poor HHs, on the average 3%/year. With some mediate targets, such as: (i) Rapidly income generation for poor households. By 2010, it will rise by 1, 45 times of 2005 figure; (ii) Facilitate infrastructure in communes with special difficulties in coastal area. By 2010, these communes will basically have essential

infrastructure; (iii) Training and capacity building for 4,500 turns of officers working in hunger eradication and poverty reduction program; including 3,600 turns of commune officers and village, 900 turns of district officers - or province authorities and other related mass organizations.

3. Strategy for economic development in the period of 2006 – 2010[25]

General purpose of TraVinh province in the period of 2006 - 2010 is to ensure stable and high growth. Dramatic shifting of economic structure towards industry – construction – services adaptive to national industrialization and modernisation. Take advantage of all available financial resources for economic growth, simultaneously calling for investment, in oder to promote growth rate, promote all fields of economy, culture and local living standard. Especially focus on proper access to production services, basic social services for the poor to overcome poverty. Enhance income generation, improve living standard of poor HHs, narrow the gap in income- living standard between urban and rural, the rich and the poor.

Agricultural development strategy: Aquaculture is key industry, gradually changes crop and product structure, effectively planning for material areas. Two main indicators by 2010: (i) Aquaculture production value of 3,454 billion dong, in which sea products 480 billion dong, fresh-water products: 51 billion dong, aquaculture: 2,641 billion dong, aquatic services: 282 billion dong and (i) Agriculture production value reachs 4,936 billion dong with annual growth rate over 4%, in which cultivation 3,646 billion dong (73.45% of agriculture production value), breeding: 947 billion (19.09%) and agriculture services: 370 billion dong (7.45%).

III. CHARACTERISTIC OF SURVEY AREA - CAU NGANG DISTRICT

Geographic location

[25] [25] Data source: Provincial poverty reduction and development strategy to 2010

- My Long Nam commune,
- Hiep My Dong commune

1. Geographic location

- Located in South east of Tra Vinh province, on the side of Co Chien river and Cung Hau seaport.
- border with Chau Thanh district and Ben Tre province in the East,.
- border with Tra Cu district and Duyen Hai district in the South
- border with Chau Thanh and Tra Cu districts in the West
- border with Chau Thanh district in the North
- There are 13 communes and 2 towns in the whole district.
- Total natural area is 32,548.39 ha, district center is 24km away from province centre, along with national road No. 53. Population is 36,000 people, Khmer people accounted for 30%,

The district locates in an advantage position for communication, socio-economy development. However, located in coastal plain, it suffers tides of Pacific Ocean from Co Chien river, trespass of sea water in dry season resulting in limited agricultural land area.

2. Natural conditions

Cau Ngang lies in the coastal monsoon tropical area, with 2 obvious seasons in a year. Most farming land become salt-marsh in dry season, requiring salt removal before growing, so fresh water time is so short, affecting agricultural production. Cau Ngang is an area of brackish, fresh or salty water by season.

In general, land is suitable for rice growing, however, most area is saltilized, and disadvantaged for production, moreover, most farming area are often lack of fresh water for irrigation in dry season, ineffective agricultural production.

3. Real situation of socio-economy

Cau Ngang is a district with the second poverty rate in the province (34.67%), there are 6/15 communes eligible for 135 programme and coastal communes (134). About 10% of HHs has no farming land.

Key production: rice growing, cereals and cattle rising, poultry and aquaculture with of sea shrimp raising semi-intensively and intensively models, oysters raising.

Table 4: Introduction of researched communes

Commune	General condition
My Long Nam	My Long Nam is a coastal commune, considered an "island-coastal commune" by the Government. It is located in the South of Cau Ngang district, with natural area of 4,867 ha, 5 villages, 1,255 HHs, including 5.636 people, average population density is 116 heads / km^2. In the commune, there are 3,478 labourers, counted for 61.7 % of total population. 292 poor HHs, taking 23.34%. Cottages make up 50% sparsely in the commune. Average income per capita is about 4.5 million/ year. Traffic system is very poor, irrigation

	system meets only 70% of production needs, underdeveloped trade and services. People rely on agricultural production and aquaculture, contributing 91.2 % common economic structure of the commune. Agricultural land area is 1,894 ha, counted for 38.9% of natural land area, 610 ha for aquaculture, making up 32.2 % of agricultural land area. Some international organisations, like Cida Canada, Oxfam, has assisted people in aquaculture, cattle raising, etc.
Hiep My Dong	Total HHs is 1155, 5281 people, 278 poor HHs, 28 HHs without cultivating land. Natural area is 1560 ha, agricultural land 1200ha. It is divided into 3 small regions: first is model of 1 shrimpt – 1 rice; 2nd: 1rice- 1 cereal; 3rd: intensively shrimp raIsing.

IV. KEY FINDINGS

1. Aqua cultural development potential of Tra Vinh province[26]

1.1. Natural resources

Coastline of Tra Vinh lasts 65 km, water territory has diverse resources with high value**,** sea product exploitation with reserve of 1.2 million tons, exploit capacity of 630,000 tons/ year. Canal system is thick, abundant aquatic products resource, with 3 large seaports of Co Chien, Cung Hau, Dinh An, nearby main grounds of fishing, shrimp, cuttle-fish of South East, it is impossible to move fishing grounds by seasons to the sea in South West, this helps Tra Vinh to exploit aquatic products all the year with stable productivity between 50.000 - 55.000 tons/year. Natural valley area is 21.265 ha and about 98.597 ha under water in 3 to 5 months / year, interior reserves is estimated at 3.000 - 4.000 tons, exploited constantly from 2.000 - 2.500 tons.

Aquatic source in coastal area of Tra Vinh includes seaport, salty forest and coastal water area with 30 - 40 m in-depth. Fish along the coastline have 40 groups, 78 varieties and 150 species including sea fish inshore, brackish fish and migratory fish. Reserve of fish in Tra Vinh seaport counted in area of net in 1994 was 62 tons (in seaports only), 274 tons floating-class and medium-class fish; area of sea and brackish water: 9.063 tons, 63.470 tons floating-class and medium-class fish. Total reserve in seaport area, inshore 72.869 tons, exploits capacity (50%) 36.434 tons.

+ Tra Vinh has natural water surface area of nearly 23.000 ha, diverse resource, stable exploitation, good natural varieties.

+ Salty-infected forests have 24.000 ha potential area to raise shrimp (especially prawn).

1.2. Potential of aqua culture area:

Land: Tra Vinh has 3 kinds of soil: (i) sandy farming soil occupies 6.65%, (ii) alluvial soil occupies 58.29%, (iii) alkaline soil occupies 24.44%, and the rest is water surface. Due to the

[26] Tæng kÕt t×nh h×nh ph¸t triÓn thuû s¶n 2001 –2005 tØnh Trµ Vinh

natural features, Tra Vinh has ecological zones and fresh water alluvial zones in Cau Ke, Cang Long, Tieu Can Districts of 74,900 ha in area. Original sea water soil zone is 120,600 ha in area including Duyen Hai District, a part of Tra Vinh Town, Chau Thanh, Tra Cu and Cau Ngang Districts and coastal river-mouth region, out of the defending dyke of Nam Mang Thit project, whose area is about 27,000 ha, is suitable for afforestation and aquaculture. The soil and climate of Tra Vinh are suitable for rice growing, industrial trees, and various kinds of fruit trees, vegetables and crops, cattle raising and aquaculture.
Basing on areas of different land types in the province, area of water surface, suitable for aquaculture, shows that aquaculture potential of Tra Vinh is very high, about 99.404 ha is possible for aquaculture (specializing, rotational cultivation)[27]

Human resource: Technical staffs capacity of the province has improved, at present about 21,660 staffs has intermediate and higher level (1 Ph.D, 76 MAs, 6.793 BAs and college graduates, 14.790 secondary technical graduates), increasing 1.5 times compared to 2001; 16 institutions (350 people) work in technology and science.

1.3. Investment in aquaculture infrastructure

In 5 recent years, aquaculture of Tra Vinh has focused in infrastructural investment for aquaculture: in 3 sectors: fishing, raising and processing

- Focus on building fishing ports, fishing stations
- Focus in some projects to raise industrial shrimp, molluses, combine afforestation and natural aquaculture
- Project of building irrigation works for aquaculture, centers of variety supplying
- Projects of building, improving factories for processing exported frozen aquatic products
- Capacity building for fishing offshore

1.4. Aqua cultural extension and protection of aquatic resources

- Center of aqua cultural extension supported in capacity building and equipment to ensure quality of variety, quarantine system, promote technical training, etc.
- Developed 49 models of aquaculture and expansion for people.
- Strengthened aquatic resources preservation: strengthen propaganda of regulations on protecting aquatic resources, fishing-boat registration, flood prevention, veterinary health and food safety
- Improved checking, controlling, dealing with violations - illegal fishing, use forbidden chemical substances, etc.
- Facilitated fishers, enterprises to participate in annual traditional days of fishing, breeding prawn into the sea.

2. Advantages and disadvantages in aqua cultural development Tra Vinh province

2.1. Advantages

- Policy to improve aquaculture as a key industry, many projects call for investment from economic sectors in 3 production sectors: exploitation, raising and aquatic products processing for exports.

[27] Tra Vinh aquaculture planning scheme by 2010

- Banks, international organizations provided opportunities, credits for aquaculture and offshore exploitation.
- System of state management in aquaculture, aqua cultural extension established to district level and in each area. Aqua cultural extension is focused.
- Close co-ordination between authorities and fishers' participations in seasoning calendar have proven high efficiency.
- The province issued some specific policies to encourage the development of aquatic varieties farming economy centers in order to favor aquaculture development
- Formation of Collectives, application of raising industrial and semi-industrial prawn models according to floating ponds with methods that hardly change water and using biological products.
- Experiences in raising and aquaculture development: deforestation leads to failure in raising shrimp. More forestation, more aquatic resources improvements. Sea-crabs raising model in salty forest is an evidence of benefits of salty forest protection.

Box 1 Mr. P. (Department of Aquaculture) said that within 10 years (1988- 1998) from 25.000 ha exploited, only 11ha left. But at present it no longer happens, people are "very worried" because raising shrimp is too risky, so they afforest actively. Protection forests (mangrove) under regeneration grows well.
Buffer zone:30% aquaculture + 70% forest (defending trees, food crops)
At present, programme of "separate shrimp from forest" is implemented.

2.2. Advantages

- Aquaculture development required larger capital, high technical labor force, high benefit but risky. 70% need satisfied, investment attraction; skilled labor force for offshore exploitation and industrial aquaculture is limited.
- Bad weather, disaster climate seriously affected exploitation and raising aquaculture
- Raising areas expansion is spontaneous, unplanned, inadequate irrigation infrastructure, causing poor efficiency.
- Technology investment after harvest remains poor. Product competitiveness in the market is not strong enough; suffer pressure from commercial and non-commercial barriers in export.
- Production skill in offshore exploitation, raising aquatic products among fishers is poor, little technical laborers, no cooperatively economic models development.
- Salty forests are illegally destroyed, causing aquatic resources loss
- Livelihood activities of coastal inhabitants

3.1 Aqua cultural development for the poor

Main livelihood activity of inhabitants in Tra Vinh province is agricultural productions and aqua cultural exploitation. But aquaculture by poor and non-poor groups is different in scale & characteristics.

Table 5. Assessment of the Poor's aquaculture development

Income generation Activities	Participants	
	Non-poor groups	Poor groups
Export market for aquatic products	+++++	**0**
Aquaculture domestic market Fishery: lower market output , high consumption	+++++	++
Raising industrial shrimp: must have enough input materials, capital and knowledge	+	0
Shrimp raising intercrop with rice growing	+++++	++ (the poor have little land or no land, only hired in digging, building dikes.
Oysters raising	+++++	+ +The poor participating in the project but with a limited number
- Raising sea-crabs in salty forests	+++++	++Exploiting natural varieties and raising in salty forests
- Raising oysters in shrimp ponds - Raising fresh-water products	+++++ +++++	++ ++
Inshore fishing	+++++	++
Offshore fishing	+++++	0

Source: Group discussion with provincial leaders and line agencies of Tra Vinh province, March, 2006

Through discussion, the poor have many difficulties in aquaculture activities

- Lack of capital, limited capacity of offshore fishing and large investment
- Lack of technical knowledge, do not follow crop calendar, technical procedures, causing epidemic diseases
- Self-awareness, assistance within community remains limited, "shrimp thief"& "fish thief" are quite popular.
- The poor have no chance to participate in long-lasting proje

3.2. Livelihood activity of inhabitants in Cau Ngang district

Cau Ngang is a district of major brackish area, fresh – salty by season, including 5 small ecological region, but inhabitants spontaneously change cropping structure, and they eliminated fields to raise shrimp, then raising shrimp-fish monoculturally, due to limited techniques, unplanned, resulting in high risks, low efficiency. Main production is rice growing and cattle, poultry raising, aquaculture accounted for only 50%.

Box 2 Mr. L. in Centre of Aquaculture Extension told some experiences in fish raising models
In the beginning, poor HHs participate enthusiatically, project supported an average of 3-4 million dong/ hh, providing variety +capital + food + techniques.
Consequently, only 50% of HHs implemented correctly and follow till the end of the project
The rest moved to another job or harvested the fish halfway of the project.

Table 6. Livelihood activity of inhabitants in Cau Ngang district

Livelihood	Assessment of the poor	Advantages	Advantages/risks
Rice growing	All the poor HHs whose land available grows rice	- key food crop in the area - Low capital - High market for products - normal skills required - Easy to preserve products after harvest. - Ensure food security	- Low, instable productivity. - Risky, easily infected with diseases. - Low value. - Low income source -Depending on weather
Fruit and vegetable growing	Some of the poor participated	- High profit - Low cost - Few risk	- Low value. - Difficult to extend crop scale because of limited market for products.
Peanut cultivating	Many of the poor participate	- High value. - Sub-product can be the food for cows. - High profit. - Adapting to coastal ecology. - Able to compete in the market. - Low risk, sustainable.	- Difficult to preserve - High requirement of irrigation. - Quite large capital
Water melon growing	Some of the poor	- Rather high value - High benefit - Low cost	- Difficult to preserve - Risky - Low competitiveness - Unsustainable
Cow raising	The poor participated in supported projects	- High value - Quick return - Easy to raise - Easy to extend scale of herds - Suitable for the poor. - Simple procedure. - little epidemic - low risk - Highly sustainable	- Limitation of food - Easily be stolen - If badly supervised, the project may be ineffective because people sell cows for family expenses
Porker raising	Many of the poor participated	- Traditional practices - Easy access - Low capital	- Low value - Risky - Unsustainable

			- Low benefit
Specialized shrimp hatching	The poor participated as paid labor	- High value - High biological productivity - Large market for products - High benefit	- Large capital - Strict techniques requirement - required large area, good infrastructure - Hard for the poor to access - Risky - Negative effects to the environment - Unsustainable - Poor competitiveness
Alternated shrimp raising (1 rice + 1 shrimp/fish)	Some of the poor	- Average value - Exploit natural shrimp - Rather high benefit - Not affected the environment - Low capital - Normal skills required - Suitable for the poor with little land	- Good irrigation system - High technique to resolve bottom layer - Only suitable to conditions of small zone
Oyster raising	The poor participated in supported projects	- Eligible - Easy to raise and take advantage of natural products – stable price - Normal capital	- Difficult to protect
Inshore fishing	The poor only fishing themselves or working as paid worker	Average income	Aquatic resources is decreasing Destroy the environment because of chemical substances usage
Fresh-water fishing	Many of the poor participate	Average income Low investment	Instable
Hiring in locality	Only the poor	Low income (15,000 d/day)	Instable
Hiring in other provinces	Both the poor and non-poor	Supporting family economic (sending family about 200,000/month)	Living far from home lacks mortal life Unsafe lives Risky
Poutry raising	Many of the poor	Sub-inncome, providing	Easily effected

in small scale	participate	nutritions Making use of food	epidemics Instable price
Small business	Some of the poor	Stable income Little risk	Limited market Requiring capital
Fruit+vegetable growing (annual industrial crops)	Some of the poor	Stable income Require experiences Low investment	Require irrigation system Provided varieties and growing technics
Afforest in salty zone combined with natural aquatic products raising	The poor can participated if capital provided	Protect the environment High benefit Sustainable model Rich aquatic resources	Require large capital - Only applicable to limited coastal area - Difficult to protect aquatic resource

Source: Group discussion with districts leaderships of Cau Ngang district, March, 2006

According to assessment from participants in discussions, there 3 sustainable livelihood models for the poor, in provision of authorities supports

- *Cow raising*: eligible for the poor with little or no land and labor force. This model has been implemented in 8/15 communes of the district "Support Project for cow raising by poor HHs – disadvantaged ethnic groups – Tra Vinh province"

- **Oyster raising**: apply to 3 groups of rich – average and poor in coastal area
  - Supported by Oxfam: general poverty reduction in this area
  - Approach: Form Collectives to allocate land to people, subsidy to buying breeds (7 million dong/ hh)
  - HHs contribute monthly guarding fees based on allocated land

- Afforestation of salty region combines with natural aquatic products raising

  - Rich aquatic resources of alluvial grounds
  - Project funded by WB has supported to afforest salty zones
  - Extend protection barriers of the sea

- Generating high profit from 2 sources - aquatic and forest. Sustainable livelihood for fishers in general and the poor in particular.

- Supporter

  + Social policy bank: providing loans to buy 02 cows, about 10 million dong/hh
  + Loan payment in: 36 months
  + If herds increased, a grace period can be extended
  + Other policies: 2,975,000dong/ hh / 3 years for paying interest, veterinary, grass varieties, technical training, etc.

  - Responsibilities of HHs

  + Apply technical procedures in breeding according to guide of steering committee of the project
  + Grow grass and prepare food for cow

+ Return both principals and interest to bank from the 4th year
+ When encounters risk, inform supervisors in the area

3.3. Survey results in the two communes

My Long Nam, Hiep My Dong communes, Cau Ngang district, Tra Vinh province have livelihood activities based on coastal resources as follows:

Table 7. Assessment on people' livelihood in surveyed communes

Livelihood	Employment creation	Income	Sustainability
Shrimp raising	2	3	Low
Oyster raising	8	10	Unclear
Sea-crab raising	9	5	High
Porker breeding	6	4	Average
Cow raising	7	1	High
Goat raising	11	11	Average
Poultry production	10	7	Average
Rice growing	1	4	Average
Peanut growing	4	2	High
Water melon growing	5	4	High
Vegetables growing	3	3	High
Inshore fishing	5	8	Low
Fresh-water fishing	6	9	Low
Working in industrial zones			

Source: Group discussion with the rich and poor in 4th in My Long Nam commune, Cau Ngang district, Tra Vinh province, March 2006.

** Listed in descending order1, 2, 3….. for example, 1 is the highest income generation activities*

According to survey results in community, model of 1 rice +1 shrimp is the most effective one, then cow raising, peanut growing, water melon growing also highly apreciated. However, this model has not been plotted, so it is impossible to affirm the effect. It is thought that this model is not sustainable and the poor can hardly access. The highest consensus reached in cow raising and peanut growing models. Cow raising is considered a sustainable livelihood, with high effect suitable to natural conditions and the poor.

In commune, people develop agricultural production model, community-based management approach applied.

- Industrial shrimp Raising model–Thang Loi Collective– My Long Nam commune, established on 17/2/2005

+ By "don dien, doi thua" programme, the collective has now 84 members with the area of 20.83 ha including raising ponds, integrated ponds, waste ponds and drainage.

+ The collective is directly under District People's committee

+ Selling stocks for members: 1.000.000dong/ stock

+ Organization: Administrative board, Monitoring board

+ Technical board: 3 graduates from university in aquaculture

+ Supply of breed, techniques: center of aqua cultural extension

+ Total mobilizing capital: 3 billion dong

+ Fixed capital: 9 ha land with contributions from share holders (1.3 billion dong)

+ Market for products: Tra Vinh Aqua culture Company

Effect: Despite all advantages, due to price changes and mass harvest at the same time, effectiveness is not high. Price from 98,000dong/ kg goes down 68,000dong/kg in risk of loss.

Beside, according to assessment from representatives of line agencies, this model has some problems: inevident management, inadequate democracy & managerial skills and technical knowledge. If there is no timely solutions, these models can not be sustainable.

- Model of oyster raising– ***Thanh Cong Collective- My Long Nam commune:*** *Applied for 3 groups of rich, average and poor in coastal area.*

- Funded by Oxfam: basically poverty reduction in the area
- Approach: Form Collectives to allocate land to people, subsidy to buy breed (7 million dong/ hh)
- HHs contribute monthly guarding fees based on allocated land

The project has just started, it is impossible to assess its effectiveness. However, in the first period, it can be seen that the Poor's participation is very limited due to pooling capitals (they have to contribute about 50.000- 100.000 dong a month), which is a challenge to poor HHs with instable income.

Group-based agricultural extension are established with voluntary members with high responsibilities and detailed purposed: group "60million dong/ ha of peanuts", Group "Determination" to implement models, extends models of cow raising.

Various Inter-group and inter-village activities: technical training, cross -visit, share experiences, support HHs in risk. High self-awareness and discipline ensure usual activities.

Box 3. Group Determination

The group has 29 members, without notice, at 14h on 27th every month, members all come to the leader's house; contribute 2000dong/ month to spend for meeting, the remain money is saved.

The group always developed new models, extended typical ones, guide people to follow. Members have chance to take part in training courses, visits, and share experiences with neighbour areas inside and outside the province.

The group is trusted and highly appreciated by local people.

Mr. Hai B¹ch – Group leader – Group Quyet tam- My Long Nam

3.3.1.Livelihood activities – impact on the poor and sustainable development

In costal areas, livelihood is often various, mainly depend on natural resources. Hence, livelihood, which easily benefit to local people, often have certain impacts on the environment. Findings in surveyed regions also presented this.

3.3.1.1 Inshore and interior fishing

- In the past, in coastal area of Tra Vinh province, inshore and interior fishing developed dramatically. Inshore fishing is only in My Long Nam commune, because Hiep My Dong commune does not have coastline. However, interior fishing developed in both communes. Due to abundant aquatic resources, large reserves, most of coastal inhabitants have boats, shrunk for their fishing inshore and interior. Fishers' boats are small; working inshore, inshore fishing is really an essential livelihood to them. In the past, inshore and interior fishing is main income source of many families. Fishing productivity is not only for self-sufficient but also for sale. Some HHs rely on inshore and interior fishing. Inshore fishing not only plays an important role in diversifying economic structure and incomes in coastal zone but also contributes to economic growth, becoming an effective solution to local poverty reduction.

However, because of extended fishing, lack of strict management, the environment is polluted; salty forests are exploited illegally, causing decreases in aquatic resources, seriously impact life of many HHs. Hence, Inshore and interior fishing is no longer an important livelihood to coastal inhabitants, because income from these activities is very low. This makes number of HHs of inshore and interior fishing decrease in recent years. Rate of HHs having boats for inshore and interior fishing is inconsiderable. In the past, most people in village 4 of My Long Nam commune have their own boats, fishing nets for fishing but now, only some. These changes occurs in coastal area of Tra Vinh province, where aquatic resources has decreased, income from Inshore and interior fishing is not enough for people to live, it is only a nutrition for HHs. Fishing capacity are very little, mainly for family meals. On the average, people earn VND 10.000 - 15.000 per day from offshore fishing, but in case of bad weather, they have a deficit. Income from inshore and interior fishing is low and instable; give reasons for shifting to offshore fishing or other industries of all people (both rich and poor fishers).

Table 8 Conclude advantages and disadvantages of inshore and interior fishing

Advantages	Disadvantages
• Traditional industry • Experienced people • Low investment • Surplus labor can take spare time • Near market	• Aquatic resource is decreasing, polluted the environment, and destroy forests. • Low and instable income. • High input cost such as boats, nets, • Instable prices of products (shrimp, fish, etc.) • Weather risks

Source: Group discussion about the rich and poor in 4th in My Long Nam commune, Cau Ngang district, Tra Vinh province, March 2006.

- Many poor and pro-poor households participate in inshore and interior fishing, most rich HHs has moved to building big ships for offshore fishing. However, fishers fishing offshore also have many difficulties, because of increasing input price (like gasoline, ice, net), but productivity reduces and price of products is low due to competition with raising products

and other reasons. Many fishing HHs do not continue with offshore fishing, there are ships for sale.

Some poor fishers had to move to other industry in very difficult situation. To the poor, it becomes more difficult when they are compulsory to move to another industry, because they are lack of capital, technique. Many HHs are inevitably in danger of poverty. Some poor HHs go on with inshore and interior fishing due to their passion or resigning themselves to the requirement of changing job (Box).

Box 4 The poor want to change occupation but powerless

My family has a traditional trade of fishing. My granparents, parents all have boats for inshore and interior fishing. When I grow up, I continued the inherited trade, but now, polluted environment and decreasing aquatic resource, I often have fail fishing. Many people give up and move to other trade of high and stable income. I also want to change my occupation to cow raising, or sea-product raising or business, but I have no capital. If I change my trade, I will still do sailing sometimes because I love this Occupation.

Mr.Doan Van B, village 4, My Long Nam commune, Cau Ngang district, Tra Vinh province, March 2006

In coming years, inshore and interior fishing will become underdeveloped. Poor community and mixed rich and poor groups often do not highly appreciate inshore and interior fishing in coastal livelihood. However, in the future, they still exist as a sub-activity in economy of people, subsidy income and make use of spare time of HHs.

3.3.1.2 Aquaculture

Aquaculture is a livelihood activity that greatly effect coastal community life in Tra Vinh. In 2 surveyed communes, despite recent developed, aquaculture has become key livelihood for people. Most HHs, including poor HHs, raise aquatic product regardless of risks, expected to escape from poverty. Aquatic products raised include prawn, green clawed clayfish, and oyster. While oyster, green clawed clayfish raising have not expanded, prawn raising has developed in these 2 communes. Most of commune resources are invested in prawn raising. Prawn raising have basic advantages beside challenges (table 9).

Table 9 SWOT to prawn raising

Strength	Weakness	Advantage	Disadvantage
- High value - Highly biological productivity - Large market for products - High benefit	- Large investment - Strict technical requirement - Large area - Difficult to access - Risky - Negative effects to environment	- Possible to intercrop rice growing and prawn raising - Large area. - Land-use-right is assigned - Utilize labor force - Skilled and experienced. - Good road system. - Developed network of prawn raising. - Extended domestic and international market.	- Capital shortage - Insufficient technique - Incomplete irrigation system. - Ragged land - lack detailed planning - low awareness of community - barrier of commercial liberalization and integration - Pollute the environment - Underdeveloped services. - Bad management of breed

	- Unsustainable. -Weak competitiveness	- Supported by staffs of aqua cultural extension . - State priority policies.	- High price of electricity, medicine - Instable price of prawn - Unhealthy competition - Epidemic risks

Source: Group discussion aiming the rich and poor in 4th in My Long Nam commune, Cau Ngang district, Tra Vinh province, March 2006.

Situation in 2 surveyed communes show that prawn raising is not a suitable livelihood to the poor, because it requires large capital, high investment, large area, skilled laborers, but the poor have low educational level, little or no land, so they have many trouble in raising prawn. Most of the poor in Dong Co village, Hiep My Dong village fail in prawn raising, economy goes down, and they are unable to repay loans to banks, facing difficult life.

Box 5 Failure prawn raising

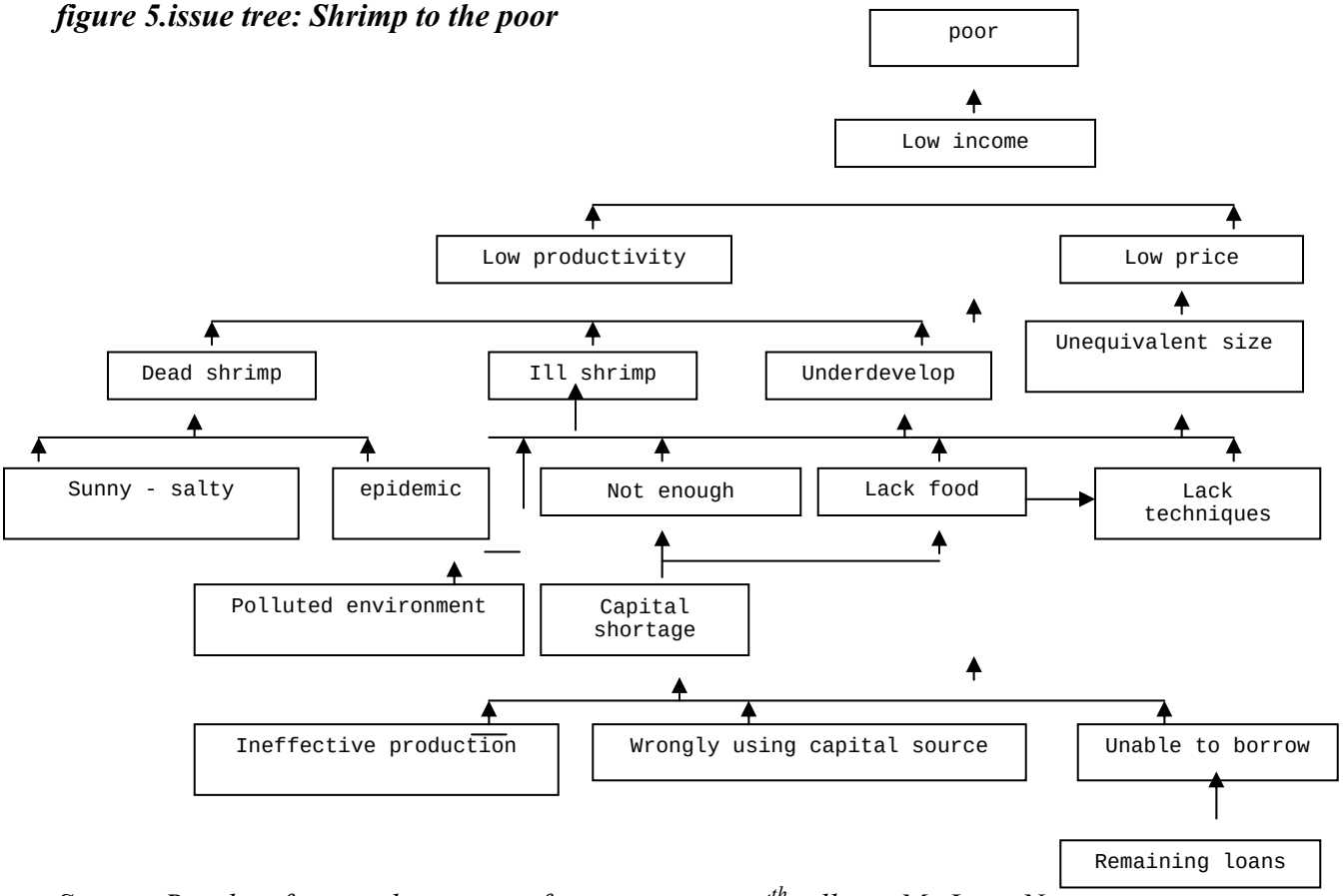
When I married, my parents gave us 18 ha land for rice growing . In 2002, shrimp raising rised in the commune, seeing other benefit from shrimp, we decided to borrow 100,000 million dong from bank to raise prawn. In 3 years, we fail in prawn raising, prawn died after abour 2 weeks. In particular, money for buying breed, each year we lost dozens million dong. Now our family life faces many difficulties, we no longer raise prawn, we worked for others, my wife does small business in local market.

Mr. Nguyen Thanh T 28 years old, Dong Co village, Hiep My Dong commune, Cau Ngang district, Tra Vinh province, March 2006.

Among shrimp raising HHs, many of them do not raise voluntarily but compulsory. They are in "unavoidable" cases because all areas move from rice growing to shrimp raising, neighboring plots are used for shrimp raising, they have to change compulsorily.

To the poor, shrimp is becoming more distant.

figure 5.issue tree: Shrimp to the poor



Source: Results of group discussion of poor women in 4th village, My Long Nam commune

Oyster raising models: In assessment of the poor, access capacity in this model is limited

Funded with 5-7 million dong/ hh (investing in variety, food, infrastructure)

Challenges:

- Every month, people have to contribute guarding cost of 50-100.000 dong- the poor have no money to contribute, so they do not want to participate.
- Protect oyster is very important, it is can easily be stolen

Source: Results of group discussion of poor women in 4th village, My Long Nam commune

3.3.1. 3. Cultivation

Cultivation originated a long time ago for people in the two communes of My Long Nam and Hiep My Dong. This is one of the basic livelihoods of coastal inhabitants. However, in the region (both salty crop and fresh crop) and sandy land is the main types of land so crop structure is not diversified, productivity is low. Crop structure include: rice, peanut, water melon, vegetable, in which rice is the key crop. Crops have different strength, weakness, advantages and disadvantages. Table 10 analysis some key crops in Tra Vinh.

Table 10. SWOT to some key crops

Crop	Strength	Weakness	Advantage	Disadvantage
Rice	- Main food crop - Low investment - Large market for products - Normal technique - Easy to preserve products after harvest.	- Low and instable productivity. - Risky. - Low value. - Low income (about 30% in gross income of Hiep My Dong commune)	- Normal investment. - low technique. - Inexperienced - Large area - Utilize rural labor - Developed agricultural services - Developed agricultural extension	- Low benefit - High prices of fertilizer, pesticide - Incomplete irrigation system
Peanut	- High value - Sub-products can be food for cows - High benefit - Adapting to coastal ecology. - Competitive capacity. - Sustainable, low risk.	- Difficult to preserve - require irrigation.	- Eligible land. - Easy to grow - Utilize labor - Low inputs investment - Easy to consume in domestic and international market	- infrastructure shortage, especially irrigation. - Poor HHs lack capital
Melon water	- high value - High benefit - Low cost	- Difficult to preserve. - Risky - Low competitive capacity. - Unsustainable	- Easy to grow - Utilize rural labor. - Low investment	- Difficult to sell sometimes - Inexperienced.
Fruit and vegeta -bles	- High benefit - Low cost - low risk	- Low value - Difficult to production scale and market for products.	- Easy to consume - Easy to grow - Experienced	- High transportation cost

Source: Group discussion aiming the rich and poor in 4th in My Long Nam commune, Cau Ngang district, Tra Vinh province, March 2006.

According to assessment of community, some eligible crops in coastal area, possibly to develop are peanuts, vegetable, water melon. Especially, people preferred peanuts, because it has high value, and easily to grow. However, difficulty to peanuts is shortage of irrigation. Peanuts needs a lot of water, wet land, fresh water irrigation. Due to alum-infected land, people have to drill well to get underground water for irrigation, thus, input cost become high. Difficulty for the poor in growing peanuts is capital shortage.

Rice, which is though the traditional crop, is very important to people, but affected by salty, alum land, rice productivity is low and instable. In 2005, Rice crop of Dong Co village, Cai Gia Ben village failed, many fields are underdeveloped, impossibly to harvest. The most difficulty in rice growing is incomplete irrigation system, not meet with irrigation

requirements of rice. Although, nowadays, rice is grown largely, but it does not play an important role in income of coastal people.

3.3.1.4 Breeding

In coastal area, structure of animals includes: cow, pig, chicken, swan, goose, in which cows is newly raised in recent years. The strongest point of cow herds is high value. A household invests about 8 - 10 million dong to buy a cow. After a year , the cow can bear a calf. At present, cow raising is becoming a sustainable and effective means of poverty riddance for people. In both communes, some HHs raise 10 – 20cows, overcoming poverty and becoming rich.

Nowadays, pig raising remain a livelihood of coastal inhabitants in Tra Vinh, though this industry sometimes is unimportant to many HHs where many new effective industries such as shrimp raising arises. Pig raising does not have very high profits, but this is a saving method. After some period of time, people can have a large amount of money to re-invest in new industry or consumption: education fees for children, healthcare, furniture. However, pig raising is not very meaningful in poverty reduction. To poor HHs, pig raising is difficult because it requires capital, especially money for food from beginning to the end of a raising procedure. Sow raising give high profit but requiring good care and higher investment. So only some rich people with capital and techniques can raise sows, the poor cannot access, same as production, business of shrimp, fish. The following analysis will present opportunities and challenges of cow raising, pig raising and poultry raising (see table 11).

Table 11. SWOT to some key animals

Animal	Strength	Weakness	Advantage	Disadvantage
Cow	- High value - Quickly profitable. - Easy to care - Possible to extend herds - Eligible to the poor. - Simple procedure. - few disease - little risk - Highly sustainable	- Large investment	- Make use of agricultural waste like straw, peanut tree - Much natural grass. - Little labor and convenient in make use of labor. - Easy to consume - Stable price. - Low investment	- People, especially the poor, lack capital - Cow raising can impact others' benefits. - Undeveloped veterinary services
Pig	- Traditional industry. - easy to access to the poor	- Low value - Risky - Unsustainable - Low benefit	- Make use of surplus labor in families. - Abundant food - Experienced. - Low investment.	- Instable price. - Difficult to consume.
Chicken, duck, swan	- Low investment-> easily to access. - Simple procedure.	- Normal benefit - Unsustainable	- Available food. - Easy to consume, mainly in local markets	- Easily infected epidemic - Undeveloped veterinary services.

Source: Group discussion aiming the rich and poor in 4th in My Long Nam commune, Cau Ngang district, Tra Vinh province, March 2006.

3.3.2 Diversifying income generation and poverty riddance

- Some more findings show that diversifying incomes can ensure sustainable poverty riddance for the poor in coastal area and do not destroy the environment and aquatic resources. And land is really their sustainable means.

**The poor have little or no land (from 0- 2 plots)*

- Mainly rice growing (spring and summer crops), growing fruit, vegetables and cereals (peanut, bean, water melon, pumpkin, vegetables, etc.) combined with pigs, chickens, ducks raising in small scale to make use of available food.
- HHs without land mainly rely on seasonal employement by other HHs in the area, like harvesting, working the soil, fertilizing, etc. But such work decreases, some HHs let children work far from home, in other province such as Binh Phuoc, Dong Nai, Binh Duong...
- Hiring wage by seasons of labourers is average of 20.000- 25.000dong/day to male and 15.000- 20.000dong/day to female. Total time of employment in a year is estimated to be 3-3.5 months.

- In discussions, people said that if they are funded, they can do livestock production in large scale such as cow raising, fishing, fruit and vegetables growing to make products for sale. Even many people need money, 500.000 dong to 1.000.000 dong at the beginning of the crops to buy fertiliser, variety, but they have no money, and they have to purchase on credit with high interest (10%). If they have money, they can get more profit in agricultural production. People can immediately answer the question on how much they need and what they will do. Buying cows, raising sows, growing cereals are activities are selected by many people and they affirm that they can easily find market for their products. Livelihood activities are very plentiful.

  Analyzing some livelihoods activities of some poor women in Cai Gia Ben village shows flexibility of the poor, they try to improve their living condition by changing strategies of livelihood. There are 3 stategies for lielihood: maintain, promote and change.

- Strategy of "maintain" relates to maintenance of current liviving standard.
- Strategy of "promote" to improve livelihood by building current assets and activities which are supported by these assets.
- Strategy of "change" to building up assets to access another activity to create higher benefits.

- Most HHs implement strategy of maintaining their current lives, they have no long term livelihood strategy

  This is a long and preferential to every one in surveyed communes. Farmers, whose life are very difficult, have to struggle for survival. Their incomes are not enough for self-sufficient, debts are always their trouble and they have no capital for production or business though they can see opportunities.
- To some other HHs, by saving, borrow money, they face risks and follow the strategy of "promote" in the direction of expand livestock production or in other field with higher profit. However, they have great difficulty in capital and market for products.

  Many HHs with livestock keeping in small scale said that they will be successful if they have capital to expand their livestock to larger scale (to raising cows, pigs) or move to

shrimp, fish raising, growing annual industrial crops. But they have difficulty in capital, and to many HHs who have livestock keeping with large scale, it is difficult to find market for their products.

- To HHs mainly live on income from aquatic products exploitation, or live on inshore sandy-beaches, they follow strategy of "retreating".

In the first time, they let their children work for larger fishing ships, industrial zones, they expect to save money to move to the trade.

Though they choose any strategy, diversifying income with spirit of overcoming difficulty is still the main problem in poverty riddance.

Box 6 : **Hiring (saving)-+ borrowing money > buyings/cows-> buying land-> fruit and rice growing/shrimp raising**

Ms. Ngo Thi Lien, whose family has 5 main labourers and 2 small children. Up to 2001 they own only 0,5 plot to grow vegetables, mainly hiring, so they get enough for 6 months. In 2001 they borrowed 3 million to buy a cow, after 12 months, it gave birth to a calf, which was sold at 2,5 million dong, they used this money for sufficiency and grow fruits. In 2004 they sold both cow and calf, getting 8 million dong for repaying loans and redeeming a plot (1,5 million dong), building well and irrigation tools (2 million dong), improving fruit and rice growing, getting average of 500- 700.000 dong/ month. Contracting shrimp and fish ponds (1 plot) and they get out of poverty

Ms. Ngo Thi Lien- Cai Gia Ben village- Hiep My Dong commune- Cau Ngang district 3/2006

Box 7. **Hiring (saving)-+ borrowing money > buying pigs/cows-> buying land-> fruit and rice growing/shrimp raising**

Ms Le Thi Bung has 2 main labourers, 2 small children in her family. Before 2003 hiring and saving, then she bought on credit 2 small pigs, one of them died, the rest sow was alive, and bear 7 pigs, she sold the sow and 6 small pigs to repary loans, the small pig later bear 7 small ones one and one. She gets money and redeems 3 plots. She raises shrimp and gets 10 million, buying a cow valued at 6 million dong, now in pregnancy.

Ms. Le Thi Bung - Hiep My Dong commune - Cau Ngang March 2006

From 2 typical stories, it can be seen that capital and land for the poor are really troublesome and also the means for them to get out of poverty.

Sustainable livelihood acivities selected by the poor

- Through discussion of groups of poor women in 2 surveyed communes give similar results as ideas of district and communal staffs about sustainable livelihood for the poor. That is a model of cow raising with funded capital.

Cow raising model for the poor has been chosen by the poor. According to them, cows have more advantages than sows and it will be successful with community-based management (box **Sustainable model of cow raising with management of community**)

Table 12. Comparison of advantages in cow raising and sow raising

Condition	Cow raising	Sow raising
Investment	10 million dong	5 million dong
Shed	Permanent structure	Temporary structure
Food	Naturally, making use of river side, pond dikes of grass, straw, peanut trees, maize trees.	Buying daily
Raising period	12 month of reproduction	5- 6months of reproduction
Revenue	Female calf: 2-2.5 million dong/one of 50 days Male calf 1-1.5 million dong	Average 2 furrows 13-15pigs 300.000/pig at 50 days
Market for products	Stable price	In stable price
Benefit	High effect	Low effect, 300.000- 500000dong/ farrow
Epidemic	Good resistance	Easily infected diseases
Challenges	When lacking money, people easily buy, stealing cows, buffaloes becoming troublesome	

Source: Group discussions of poor women in Cai Gia Ben village, Hiep My Dong commune and 4th village in My Long Nam commune, Cau Ngang district, Tra Vinh province,March 2006.

Box 8 Sustainable model of cow raising with management of community - HiÖp Mü §«ng

Ms. Tu .Head of women's union in Cai Gia Ben village shared her experiences: Form groups of people raising cows : between 15-20 HHs (supporting, supervising)

- Setting up list of voluntary HHs till the end of the project
- Conditions: Attending in a mass organisation (women's union, famers's union)
  Industrous
  Owning little or no land
  Have main/sub labourers
  Follow group regulation (procedures of buying varieties, caring, epidemic protection, returning loans, etc)
- Selected group leaders : to observe, selecting variety, guiding breeding methods, encouraging HHs, organizing meetings to share experiences.
- Cost: Voluntary raising HHs contribute 5000 dong/ month. Support group leader with 30-50.000dong/ month, the rest used for meetings.
- Monthly savings to repay loans: At the current time 10000- 40.000dong/ month, average of 20.000dong/ month. Group leader is responsible for this.

V. SOME RECOMMENDATIONS FOR STABLE LIVELIHOOD ACTIVITIES IN COASTAL AREA IN TRA VINH PROVINCE

1. Solution to stabilize diversified incomes:

In fact, the process of traditional agriculture in general and rice cultivation in particular does not bring much profit to Tra Vinh people. But they have to lean on rice regarding it as the staple to ensure food and avoiding shocks because of the fact that they can not find an alternative source of income. Rice and peanut tree are main crops to farmers in Tra vinh province.

Besides such traditional ones, the local government and community has selected some sources of livelihood that are appropriate to ecological features of territorial water such as: mangrove forest's cultivation in combination with natural aquaculture and specialized aquaculture, extensive farming in low-productivity agriculture soil, rice and farm produce in sandy soil, cultivation in bare bank to improve income.

It cannot be denied that applying these means, people have to accept unexpected natural risks as well as limited resources. To ensure the stability and efficiency of these means, comprehensive solutions that minimize cost for local people, especially the poor who take part in cultivating aquaculture and other kinds of stable means of livelihood should be worked out.

*Subsidy policy from the government:

- Gather intensive sources to carry out irrigation projects on specialized and extensive aquaculture.

- Solutions for irrigation for dry areas such as: slope and sandy soil .

- Strengthen administration and apply technical process to variety production, food prosess, food preservation and consumption.

-Establish seed plants and centres to test quality of seed in local communes and districts.

- Establish an information centre to provide aquaculture knowledge and techniques

- Strengthen training in aquaculture cultivation knowledge, focusing on practicing and setting up models (cooperation, aquaculture cooperative) and strengthen models supervision and management to ensure efficiency and stability.

- Reinforce specialised staff for local organisations. Establish network of to support fisher family like the one in My Long Nam village.

- After crops, concentrate on science and technique, develop factories producing frozen products.

- Carry out insurance policy to limit disadvantages.

Financial solutions (loans/credit):

*Aquaculture cultivation:

-Mangrove forest: loan period is more than 5 years, which is enough to cultivate 1 ha of forest; aquaculture variety and others appropriate creatures.

* Cultivation area :

-Loan period is 2 years, preferential interest; average loan level is 10 per house hold which is enough for 1 ha of area cultivation.

-Loan period is 18 months, preferential interest; average loan level is 10 per household which is enough for initial investment of 2 parts of rice and peanut cultivation.

-The focus is on farmers' commitments to their loans because the poor are in fact not good at capital management

-Method of lending: Through associations (especially the role of women's society), group of cooperation to strengthen the administration of community and support each other whenever there is any disaster.

Market solution:

- Establishing supportive system for agriculture, aquaculture at communes, districts to ensure the quality of input price like variety, food, materials, fertilizer, technical services and insecticide.

- Establish firm association among 3 and 4 households, among enterprises and cultivators to guarantee mutual benefit.

2. Selected model:

2.1. The project manager:

With the aim to increase the capacity for management, community administration and assisting the poor in sources of subsistence, the appointed leader of project is of communal level, working under the control of district government.

2.2. Project area and beneficiary:

-In 2006-2010, the stable area of pro- poor aquaculture development is the one which is under by district govenrment program.

- small ecological -diversified areas to carry out the project aming at diversifying income.

- Based on the result of communal seminar, the group of consultans has reached an agreement that Cau Ngang district is the appropriate area for running support project for the poor in coastal area.

- According to drawn experience from communal models, it is essential to have the percentage of about 25% of better-off and wealthy households who can share experience and support in technique for the newcomers, besides, the better-off and wealthy ones also acted as mirror for the new ones to overcome difficulties.

2.3. The selected means of livelihood:

-Due to the fact that infrastructures for aquaculture are limited, it is difficult to build a specialized manufacturing area (focus on aquatic product and seafood). The continuation of one-crop time is essential to poor farm areas in Cau Ngang district to ensure firm source of food supply. If poor poeple are only subject to traditional agricultural methods, it is difficult

to eliminate hunger and reduce poverty regardless of highly-potential aquaculture development .

-According to detail programme in consultant with local government and boards, the consultants have conducted some means of firm livelihoods that based on suitable resources and assist solutions enclosed. People will benefit from the results that they recognise the importance of sea resources. As a result, they will limit means of subsistence which are harmful to the environment and stable development such as: illegally and coastally aquaculture, deforestation, break programme etc that exhausted coastal sea resources).

Table 13: Analysis of selected models for livelihoods activities

Model	**Advantage/ Effectiveness**	**Support solution**
Mangrove afforestation in combination with natural aquaculture's cultivation	-The benefit from inshore alluvial ground is diversified and plentiful. Experience gained from forest destruction, the communal improve awareness of the role of mangrove. - The project of mangrove afforestation is supported by World Bank. - Creating good value from the two main sources of income - aquaculture and forestry - Strengthen sea security - Ensure stable means of livelihood for every local people in general and poor farmers in particular.	- Grant loan with loan period of 5 years, grace interest, average loan level is 20-25 millions VND per house hold which is enough to cultivate 1 ha of forest, aquaculture variety and others appropriate creatures. - Supply seeds, technique of looking after some kinds of tree which are suitable to mangrove area and have high economic effectiveness (Mangrove, cajuput, crab, shell, honey bee, etc, -Strictly reinforcing administration and supervision of forest protection
Molluse cultivation	- Suitable to conditions of water territory - Competitive - Products are easy to sell in domestic and foreign market. - Less risk, high level of stability. - High economic value. - Big profit	Grant loan with loan period is 2 years, grace interest; average loan level is VND 10 million per household which is enough to cultivate 1 ha of area. Strengthen sea protection Offer practical solutions to minimize unexpected natural hazard. Develop fishing support service at communal level.

Model	Advantage/ Effectiveness	Support solution
Rice cultivation and other farm produce's cultivation (short–time industrial crops)	- Farmland with suitable condition to short time industrial crops, especially sandy soil. - Cultivation technique is not complicated. -The labor force is abundance -The essential investment to buy pump, well drilling and buy variety is not high. Products are easy to sell in domestic and foreign market. - High economic value -Ensure food security - By-product is food for cows. - Big profit.	- Solutions for irrigation system for areas with water shortage such as: slope and sandy soil. - Gather intensive sources to carry out irrgation projects. - Grant loan with loan period is 18 months, grace interest, average loan level is VND 10 million per household - Develop fishing support service at communal level. - Encourage agricultural expansion at communal level.
Raising reproductive cow	- Suitable to poor farmers. - Easy to take care - The process of raising is not difficult, it can make use of agriculture by-product such as: straw, peanut tree - Take advantage of labor force. -Less disease - Less risk - Stable price. -High economic value - Profitable. -There is high capacity for expanding the scale of herds	• Grant loan with loan period is 3 years, grace interest; average loan level is VND 15 million per household. • Strengthen communal administration. • Supply grass seeds and other veterinary services