Fisheries co-management in Viet Nam

PAPER WRITTEN FOR REGIONAL CONFERENCE ON THE SMALL-SCALE FISHERY CO-MANAGEMENT IN VIETNAM

Subject : Some initial results in development of fishery co-management models in Binh Dinh province

MSc. Trần Văn Vinh –

Binh Dinh Sub-department of Fishery Resources exploitation and protection

1. Introduction

Binh Dinh province has the natural area of 6.075,33 Km2, with 4 coastal districts and City: Hoai Nhon, Phu My, Phu Cat and Quy Nhon City and 4 communes of Tuy Phuoc district that are along western side of Thi Nai lagoon, have also coastal economic activities.

With the coastal line of over 134 km and 3 big lagoons: Thi Nai, De Gi, Chau Truc and thousand of ha of pond, lake water surface,… in which many kinds of high valued economic fisheries. Fishery resources are one of the provincial high potentials. Annually the resources has provided work for over 50.000 labourers in fishery exploiting and aquaculture using natural seed and nearly 2500 labourers in logistic sectors: processing, boat buiding,… those have contributed significantly into the provincial economy and foreign currency for the provincial budget.

To ensure the protection and exploitation of fishery resources suitably in coastal areas, biodiversified preservation of coral reef, salt-marsh,… it needs to zone and to decentralize with the aim of making conditions for fishermen to receive other interests as they part in management process and using resources according to the co-management model. Fishery resources co-management is considered as responsibility and power sharing systematically between management authority levels and local inhabitant who use the resources, they together manage, use the resources in a waterbody effectively and sustainably.

Therefore, in the strategy of fishery sector development in Binh Dinh to 2010, the development of co-management model is put in the program of fishery resources development and protection. Basing on the survey on situation, socio-economic condition of each region, area and other relative problems that impact on the sustainable development of fishery resources, as well as the demand of fisherman community and local authority, from 2006 to now the Binh Dinh fishery sector has carried out and developed co-management models on protection of fishery resources in two areas: Tra O lagoon, Phu My district and coral coastal area, Nhon Hai commune, Quy Nhon city.

2. The co-management model on fishery resources protection in Binh Dinh

2.1. To develop the co-management model on fishery resources protection in Tra O lagoon, Phu My district, Binh Dinh province

Tra O lagoon is one of three big lagoons in Binh Dinh province, it has the gate to the sea through the Ha Ra seaport. Its water surface is 1.200÷1.600 ha. This is one of lagoons that has ecosystem features of the wetland in the Centre of Vietnam with plentiful food resources and water environment and good hydrography so there are many kinds of water larva and seafood that live and develop. The lagoon is also the nursery garden of shrimp, fishe and crab and molluse and the resources of shrimp, fishe and crab to mature groups living in closed territorial waters.

Beside the economic development, as pressure on population increase, living needs so some parts of inhabitant living in lagoon's bank have done activities of fishery exploiting by using many different kinds of destructive gear as: electrical gears, small mesh net size gears to overexploit fisheries; exploiting and consumption of valued and rare fishes or extinct species as eel (angullar) that is in the list of protected animal. Otherwise, as there is no the planning of fishery exploiting in water areas in lagoon so the increase of exploiting gears, different gears have increased the exploiting intensity in one water area; the disputation of fishery environment among households as well as using of water-flooded areas to widen rice cultivation and waste of fertilizer in agriculture … Activities of inhabitant community and the change of ecosystem in this area have made the lagoon's area smaller, water environment polluted, the fishery resources in Tra O lagoon in recent years has reduced seriously, this impacts directly on the livelihood of the community.

From recommendation and petition of inhabitant community and local authority on solutions to protect the fishery resources that is reducing seriously and impacting on inhabitant's life, Binh Dinh PPC has assigned the sub-department of fishery exploiting and protection to study, analyse and assess the situation of fishery exploiting scientifically and fully to find out detail and feasible solutions on fishery resources exploiting and protection effectively and sustainably as well as to show the community's responsibity in management, exploiting and protection of fishery resources in Tra O lagoon where has the specific features of the water-flooded area. So it becomes the foundation of application of solutions to carry out eploiting management models, to protect and develop the fishery resources in lagoons in the province.

After three years (2006 – 2008), the implement of fishery resources co-management model in Tra O lagoon, the co-management of fishery resources has reached following results:

2.1.1. The model's feasibility

+ The model has reached the high agreement from inhabitant community around the lagoon.

+ To issue regulations on activity for core groups is the commitment of local authority in supporting and cooperating in protection and development of the fishery resources.

2.1.2. The firm foundation of model development

+ The authority (DPC) approved the model.

+ Regulation on management, exploiting, protection and development of fishery resources in Tra O galoon to implement the regulation in co-management model.

2.1.3. The model has implemented fully basic contents on fishery resources management in Tra O lagoon.

+ To manage the living environment of fisheries, specific system in Tra O lagoon.

+ To protect fishery resources especially specific ones: angullar, turtle, gobby,,,

+ Right and responsibility of the community in fishery resources are established scientifically and effectively.

+ To reproduce and suplement the fishery resources basing on the consciousness and agreement of the community that are institutionalized through regulations by the authority.

2.1.4. Economy

In comparison with areas that have not developed co-management model to lagoons as Thi Nai, De Gi, at Tra O lagoon the active participation of the core groups has prevented and minimized the potential pulse about 50% in comparison with the beginning. The households doing handicrafts have effective income because of high quantity of fishery product compared to 2006.

2.1.5. Society:

+ Fisherman households doing handicrafts in Tra O lagoon have stable income, there are 53 households who volunteer to share money to recover the fishery resources in Tra O lagoon.

+ Most of fisherman in the lagoon has been improved the awareness of fishery resources protection. According to the second awareness investigation, there are 90,28% of inhabitants who said that: sea-eel is the exploiting-forbidden animal, the fishery resources reduced and environment polluted because of using electrical pulse and small mesh.

+ 87,50 % of inhabitants said that the work of fishery resources protection has been widen to each fisherman community, and they are already to denounce the using of electrical pulse at Tra O lagoon.

2.1.6. Policy and regulation:

+ Management regulation on the fishery resources protection at Tra O lagoon has been supported and obeyed.

+ The legal documents on the provincial and central fishery resources are carried out effectively.

2.1.7. The sustainability and ability of widening the model

- The co-management of the fishery resources protection in Tra O lagoon is widening and developing in lagoons: Thi Nai, De Gi.
- Having the financial resource to carry out regulations.
- Having high absorption of projects, sponsors: receiving the support from SCAFI – Ministry of Agriculture and Rural Development in training and improving the capacity of the co-management core group and Global Environment Fund (GEF) continues to support solutions of livelihood and capacity improvement in Tra O lagoon. In 2008, Vietnamese government dicided the planning of Tra O lagoon becoming the provincial domestic preservation area.

2.2. The co-management model of Fishery resources in Nhon Ha commune, Quy Nhon City

2.2.1. Characteristics

Nhon Hai is a peninsula commune to the East of Phuong Mai peninsula in Quy Nhon, Binh Dinh, with the geographical location: bordering Nhon Ly and Nhon Hoi commune to the North, Hai Cang ward to the West and the South, the East sea to the East. It is divided into 4 villages: Hai Dong, Hai Nam, Hai Bac and Hai Giang. Its population is 5816 people with 1221 households in which there

are 137 poor ones. According to the current socio-economic criterion, the commune is defined as a special poor island commune.

+ The natural area: 1200 ha, its coastline of 15 km with the coral ecosystem, turtle, plentiful coastal fishery resources, especially natural seed lobster.

+ Community's economy: coastal fishery exploiting: seine net with light, gill net with light, exploiting of coral fish resources, seed lobster exploiting (diving, trap, trap with light), the number of small fishing board is about 500.

This area annually is exploited with explosive by fishermen who come from other regions to have fishery and coral; the lobster aquaculture spontaneously in float cage so the food's waste has created disease and impacted on the development of the coastal coral. Moreover, inhabitants have not paid attention to turtle protection so they have catched turtle, turtle's egg at breeding ground those have effected significantly on the turtle's reproductivity in this area.

Basing on the demand of local community, the co-management model of Nhon Hai fishery resources was developed by Sub-department of Fishery resources exploiting and protection with the support of FSPS II Binh Dinh in 2008-2010, with the aim of " to establish the effective management model of coral, to protect and sustainably exploiting the lobster resources basing on the regional community of Nhon Hai area, Quy Nhon, Binh Dinh.

2.2.2. Some achieved results

- The awareness of inhabitant community on protection and development of fishery resources in coral area is improved significantly, 100% of household commit to not use explosive, not exploit coral and to protect the egg area of turtle.

- Fisherman community and organizations volunteer to part in the core group to protect the fishery resources. Nhon Hai CPC agreed with the community's promotion by issueing the Dicision N^0 45/QD-UBND dated on April 22, 2009 on the establishment of the co-management core group in exploiting and protecting the fishery resources in Nhon Hai commune with the group's action regulation.

- The development the regulation on fishery resources exploiting and protecting in Nhon Hai commune has been parted in and received the support by fisherman community that show the commitment with the local authority and community in implementing policies on the protection of fishery resources at Nhon Hai commune.

- Support for livelihood for fisherman community on seaweed grow technique done by Le Ben – Tri Tin Company Co.Ltd by technical guidance and pilot researches at the coral area have focused on the core group then widened into fisherman community.

- The co-management core group of fishery resources developed the action plan and carried out detail following programs:

Propaganda

- Propaganda on Law of Fishery
- Propaganda on the instruction 12 of PPC on prohibition of coral exploiting
- Propaganda on register of board
- Propaganda on HIV prevention for fishermen
- Propaganda on fishery resources protection and development.
- Propaganda on environment protection.

Training

To cooperate with the Department of Agriculture and Rural Development, Sub-Department of Fishery resources exploiting and protecting; the management board of FSPS II Bình Định to hold training cources.

- To train poor farmers on aquatic fishery aquaculture: seed lobster, oyster
- To train farmers on technique of Japanese seaweed grow
- To mobilize pupils, fishermen to clean the sea environment.

Patrol and control

The core group weekly sends 2-3 members to inspect during 5 days in water areas: Hon Kho, coral area about the situation of fishery exploiting and aquaculture area. Member's task:

- To prevent and inform to local authority about broken cases.
- To educate, remind and propagandize broken cases
- To report the inspectation to the core group.

The co-management core group cooperated with Boder-guard, CPC to prevent a coral exploiting, fishery exploiting with explosive by fishermen from Hai Cang ward.

3. Basic steps in development of co-management model in fishery resources protection in Binh Dinh

In general, the implement of co-management model on fishery resources is developed and experienced through the basic following steps:

Step1: Chose and define the co-management model

To define the situation: the fishery resources is destroyed, reduces; fisherman community's livelihood and income are reduced; the exploiting and using the fishery resources not basing on the law....

To find agreement:

- The promotion from fisherman community, organizations or commune authority.
- Primary survey and collect all information and current statistics on the area and community in the area as: population, socio-economic condition; fishery acitivities: exploiting, aquaculture, environment, resources; conflicts in resources using; environment protection.
- To hold interviews, discussions, meetings with the participation of relative villages, communes and members with the aim of:
  - To assess the fishery in commune
  - To know about the management of fishery in commune
  - To discuss potential solutions on co-management issues
  - To discuss potentials of co-management development according to commune-based co-management.
  - Other relative issues
- To give the fishery resources co-management issue to discuss and unify some basic contents on the implement of the model as well as to consider the willing of local authority in developing the fishery co-management model and their commitment to this responsibility.

To prepare a detai program (scheme): including the imperation, development foundation, action content and plan; time; place; individuals and organizations who participate, cooperate, forcast results, expenditures…

To establish the member group to implement:

The member group to implement co-management activities who are chosen from active members of inhabitant community, local authority, professional organizations on environment protection and fishery resources, they have active and skilled role in management and control the fishery resources. The members are:

- Representatives from authority and fisherman community
- Sub-department of fishery resources exploiting and protection
- Bureau of Agriculture and Rural Development at district and city level.

Besides, we can invite technical consultants on fishery resources, environment; sponsor organizations who part in research, consultancy on relative issues as fishery resources control, management as well as to propose suitable solutions to the current situation in the locality.

Step 2 : Model development and implement

@ To start the model

The member group will carry out the model in the start process of fishery resources co-management; detail activities:

To develop the capacity of community's organization

- To hold meetings, conferences to make relations with the community
- Planning of propaganda
- Training organization: communication skill, management skill and conflict solution skill; skill of development and implement the action plan; checking skill, cotrolling skill and cooperative skill in broken treatment
- To develop research program to assess socio-economic condition, to investigate the resources and fishery environment.
- To specify demand, advantages, disadvantages and conflicts in exploiting and using the fisherman community's fishery resources.
- To develop livelihood solutions to community
- To assess, collect active members from community, organizations, authority and relative agencies.

To improve the inhabitant community's consciousness in the fishery resources protection

- To hold propaganda
- To print tờ bướm, giấy cam kết
- To mobilize the committment
- To issue posters
- To develop reward regulations

- To hold investigation, mobilization and consultancy

- To develop the fund of environment and fishery resources re-creation

To develop regulation on fishery resources management and protection

- To develop the regulation on fishery resources management and protection

- To establish village regulation through the community

- To issue assessment criteria for community

To establish and organize co-management model

- To establish the Management Committee of fishery resources: the commune's or inter-commune's co-managament committee (depends on scale, geographical features, socio-economy of each region,…)

- To establish the core group on co-management of fishery resources.

@ To carry out the model

At this period, the fishery resources co-management committee will play the main role in implement and operation of the fishery resources co-management model including following activities:

- Planning the co-management

- Developing action regulation for the fishery resources co-management core group.

- Developing the cooperative regulation for the core group and local authority with relative units (sercurity, border-guard , inspectorate,…)

@ To operate the model

The core group bases on the planned program that is approved by the committee then the group carries out activities on fishery resources co-management in detail:

- To propagandize the community about the regulation on fishery resources exploiting and management, sustainable exploitation, fishery aquaculture technique.

- To hold patrols, investigation and to cooperate with functional agencies to prevent and solve broken actions in the fishery resources protection.

- To assign tasks for the group's members depending on experience, relationship; to schedule time suitably to their work or the time when they are exploiting, aquaculturing in the protected water area.

- To follow up and report the situation of fishey environment, resources to the committee.

- To reflect timely proposes and recommendations on management and use of fishery resources from fisherman community in the locality.

- To propose rewards and punishments to the group's members.

Step 3 : To report and control the co-management model

The process of co-management operation is the combination among the committee and the core group in the management, use, protection and presevation of the fishery resources; establish an organization of co-management in cooperation from planning → develop the plan → implement the plan → control and investigate the plan implement.

The co-management organization will report to the local authority, relative agencies; to follow up, control and assess the reached index at each period of the fishery resources co-management, as

well as to propose recommendations that are suitable to the regulation, policies at all authoritative levels in exploiting and using the fishery resources.

Timely, the fishery resources co-management model can repeat activities focusing on step 2 and 3 but activities that are supplemental, adjusted ones with the aim of making the activities beter and beter in exploiting and using the fishery resources effectively and sustainably in the community.

It is noticed that in the fishery resources co-management model, the fisherman community will participate fully in steps:

- Investigate fishery environment and resources
- Propose and recommend on development of regulation on fishery resources management and use.
- Train and propagandize to improve the awareness as well as hold meetings of assessment on the process of co-management implement.
- Choose livelihood
- Solve conflicts in community
- Organize co-management
- Make suggestions on collecting members
- Plan and control the protection of fishery resources monthly, quarterly and annually.

4. Lesson-leart and successful factors in development of the fishery resources co-management model in Binh Dinh

4.1. Lesson-learnt

The development of fishery resources co-management model is the process implemented in rather long time (at least 3 years), with many sandwich activities and depends much on the condition of socio-economy, community's awareness, area of water, fishery resources and trandition and custom of each province as well as the staff's capacity,…

1. Location to develop the fishery resources co-management model is the first and very important step in the plan of the fishery resources co-management development at provinces:

- The expectation of fisherman community and local authority
- Area and geographical of water area
- Fishery resources distribution

2. Collection of personel for member groups, management committee, core group must be concretized on capacity, skill, knowledge, virtue….

3. To develop legal regulation on model implement

4. Need to have the fisrst technical and financial support from authority, sponsor for member groups in development of the co-management model and community organization.

5. Need to have the closed cooperation among fishery resources protection agencies, organization and local authority, especially at commune level.

6. The agreement of community; the responsible cooperation of authorities at commune and district levels and community organization.

7. To make opportunity and to mobilize inhabitants to part in co-management organization.

8. To choose suitable livelihood and meet the community's demand.

9. To enhance the roles of organizations in the fishery resources co-management.

4.2. Successful factors in co-management model

The co-management model successes or not depending mainly on the design of the detail organization. Generally, the co-managment model requires the cooperation among sides; the establishment of suitable democratic mechanism; the compliance of devolution principle; the adaptability to social conditions and specific regulations of each region where model is developed.

- **Adaptability**: The co-management model of fisheries resources is suitable to geographical position, natural condition, fisheries resources, socio-economy, culture, legal and tranditional custom of inhabitant community at the region where model is developed; expresses the demand and expectation of inhabitants.

- **Cooperation**: shows the cooperation and commitment of fisherman community and local authorities at all levels; fisheries resources protection agencies; member organizations who agree with the implement of fisheries resources co-management plan at a detail region, water area.
- Equality and democracy: All problems relative to co-management must be discussed and taken the ideas from community; the community organization must participate in implement and management fisheries; to share the right of making dicision with authority; to share responsibility to ensure the sustainability of fisheries. Problems as conflict, interest and livelihood relative to fisheries resources are also publicized and solved with the community's ideas.

- Decentralization and devolution: express through specific dicisions of authorities at all levels who decentralize the dicision making and responsibility in fisheries resources co-management that are given to communes, villages, teams and co-managment organizations.

- **Institution**: the development of regulations, rules and by-laws relative to fisheries resources co-management base on legal foundation that are received the agreement from fisherman community and approval from administrative agency; all inhabitants and organization that related to use and protection of fisheries resources at the management-developed area must obeyed.

OBSERVATIONS ON THE APPLICATION OF FISHERIES CO-MANAGEMENT MODELS IN BINH DINH PROVINCE (VIET NAM)

Dr Peter Todd
Fisheries Consultant
VSA/SAREP

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Abstract

Three case studies of Co-Management in fisheries in Binh Dinh (Tra O, Ghenh Rang, Nhon Hai), were evaluated against four criteria which can be considered to be essential for the successful implementation of Co-Management. Of the three models, Tra O Lagoon is the most advanced and has been in place for 2 years, beginning in 2007. The other two models are in the earlier stages of implementation. All case studies meet the four criteria. There is a strong policy and legal framework at the National and Provincial level to promote the introduction of Co-Management initiatives in Binh

Dinh. At a community level fishing communities are effectively empowered to undertake fisheries management within their defined community areas. Effective partnerships have been developed between the fishing communities and the Government agency responsible for fisheries management (SAREP). In the short term, the Co-Management models as being implemented are successful. However the longer term success of the Co-Management models will significantly depend on creating a funding base for the activities of the Co-Management Councils and Core Groups.

1 Introduction

Coastal fisheries in Viet Nam are considered to be small scale fisheries, located in coastal near-shore waters. With increasing population pressure and the development of more effective (and/or destructive) fishing methods, these fisheries are increasingly over-exploited, causing hardship for the many coastal fishing communities.

The small scale coastal and near-shore fisheries in Binh Dinh Province fit this pattern. These small-scale fisheries comprise a significant proportion of the fisheries economy in Binh Dinh. They are located within a 50-metre deep line from the shore, where approximately 80% of the total catch of all fisheries occurs. The main fishing methods are small gillnets (mackerel, shrimp, cuttlefish), small trawls (shrimp), longlines, push nets, lift nets (some with lights), and various fish traps. These fisheries include marine coastal waters, estuaries, lagoons and lakes.

As with elsewhere in Vietnam, the small scale fisheries in Binh Dinh are recognised as being over exploited, causing hardship for many coastal fishing communities whose sole or principal source of income is derived from fishing. In 2007 the marine catch in Vietnam coastal waters (including Binh Dinh) was estimated to be 1,800,000 metric tonnes or more than 3.0 times the estimated Maximum Sustainable Yield (MSY) of 582,212, metric tonnes (Pomeroy et. al 2009).

Binh Dinh has 13 fishing communities listed in the World Bank Report (Appendix A) 2005, in a list of 157 Coastal Communities facing difficulties.

The main threats to sustainable management of these coastal fisheries are the high level of exploitation and serial depletion of fisheries resources. This serial depletion is sometimes referred to as “fishing down the food web”. That is depleting the larger species at the top of the food chain, and steadily catching smaller and smaller fish of less preferred species, including invertebrates, of low economic value. The over exploitation is driven by overcapacity of the fishing fleet: “too many vessels chasing too few fish”. The over exploitation includes the continued use of illegal and destructive fishing methods. Although these methods are illegal and heavy fines may be imposed, there is a general lack of enforcement due to limited resources.

The most effective option available for improved resource management to address the problems of small scale fisheries is Co-Management, the sharing of responsibility for resource management between local communities and the Government. The 2003 Fisheries Law and subsequent regulations provide for this. Over the past 2-3 years Co-Management models have been applied at a Provincial level to begin addressing the problems facing small scale fisheries.

In Binh Dinh, the application of Co-Management models is being progressively applied to several fishing communities by the Binh Dinh Sub-Department of Fisheries Resource Protection (SAREP).

There are two essential elements to the Co-Management of fisheries. The first is the partnership between the Government authority responsible for fisheries in the Province, and the local fishing communities. The second is the stakeholder (fishing community) participation and empowerment to undertake fisheries management actions within their community fishing areas.

To examine the application of Co-Management in Binh Dinh small scale fisheries, I first examined the principles or criteria for the successful application of Co-Management models. There are several published reviews and analyses of the Co-Management approach to small scale fisheries around the world. The Co-Management model is not unique to Vietnam. The Co-Management partnership approach has been progressively applied in developing countries around the world as it became apparent that a "top down" Government approach was not effectively managing small scale fisheries. Neither were locally based management initiatives successful where there was no involvement with the Government agencies that had overall responsibility for fisheries management.

2 Co-Management Definitions and Principles

There are several published papers covering the implementation of Co-Management (see Brown et. al. 2005). The provide a useful summary of the definitions and principles for the application of Co-Management. For the purpose of this analysis, I will examine the Co-Management models being applied in Binh Dinh against some of these criteria.

Co-Management can be defined as "the sharing of decision making and responsibility for the management of fisheries resources between the local fishing community and the government centralized management".

Brown et.al. 2005 give four main criteria for the successful application of Co-Management. These are:

1) An enabling policy and legal framework
2) The participation and empowerment of fishing communities
3) Effective linkages and institutions
4) Resources: a resource worth managing and the people and resources to do it.

I examined three Co-Management models being applied in Binh Dinh that are at different stages of development: Tra O Lagoon, Ghenh Rang and Nhon Hai. The Tra O Co-Management model was introduced is 2007 and could be considered to be a fully functional Co-Management model. The Ghenh Rang and Nhon Hai models are at the early stages of development. Each of the three Co-Management models were evaluated relative to the four criteria listed above.

2.1 Enabling Policy and Framework

Policy provides the overall framework for managing fisheries through the setting of goals and objectives. Legislation provides for the formalisation of these policies through regulations, both at a national and provincial level. The effective application of Co-Management at a local level requires a

national policy recognising Co-Management as a national goal. The national policy and legal framework in Viet Nam for small scale marine fisheries is described and reviewed by Pomeroy et. al. 2009. The concept of fisheries Co-Management was introduced by the then Ministry of Fisheries in the mid-1990s and is accepted as the national fisheries management approach to small scale fisheries. The application of Co-Management models in the Provinces is a relatively new. Binh Dinh has adopted Co-Management as the preferred option for managing small scale fisheries. At the provincial level, SAREP has the authority and ability to apply Co-Management to small scale coastal fisheries in partnership with local communities. Binh Dinh (SAREP) therefore has implemented the enabling policy and has a legal framework in which to operate, thereby meeting the first criteria for the successful application of Co-Management models.

2.2 Empowering Communities

For the application of Co-Management in small scale fisheries, the participation and empowerment of local communities to undertake fisheries management activities is critical. The degree of empowerment, and the partnership participation of the Government agency, is essential for this to work effectively. To apply Co-Management, there must be local regulations that will empower appointed community groups to undertaken various fisheries management functions, including the enforcement of national and local regulations.

In Binh Dinh, empowering legal authority to fishing communities has been provided through the Binh Dinh People's Committee at the highest level of Provincial Government. This empowering authority allows local regional People's Committees with authority over fishing communities to set up Co-Management regimes.

For each Co-Management model, a Co-Management Council is established under regulations approved by the local People's Committee. The Council is made up of approximately nine people appointed from local Authorities and local communities for a two year term. A small operating budget is available but the individual participation is voluntary, with no remuneration. The Council has overall responsibility for the application of the Co-Management model across all the fishing communities within the Co-Management area. Reporting to the Council are the Core Groups. There is usually a Core Group of approximately 5 members for each fishing community within the Co-Management area. The number of Core Groups may vary depending on the size of the fishing communities within the Co-Management area. One Core Group may cover more than one fishing community. Members of the core group are selected by the local community and will include the leader of that local community. Membership of the Core-Group, as with the Council, is on a voluntary basis.

To be successful, there must be a clear definition of the objectives and desired outcomes of the Co-Management model, so that all participating groups have a clear understanding of what is trying to be achieved. The management objectives should not have a single focus on fisheries resource sustainability. Ideally, the management objectives should include balancing the ecological well being (sustainable fisheries regimes, habitat protection and restoration) with human well being that provides for long term sustainability.

The objectives, code of practice and the roles and responsibilities of each of the key groups should be established through a consultative process. For the case studies in Binh Dinh, the roles and responsibilities of the different groups have been well established. A code of conduct, and roles and responsibilities for each Co-Management model has been, or is in the process of being prepared. The preparation of the Code of Conduct and Roles and Responsibilities is undertaken by SAREP and is consulted on and agreed by the local People's Committee, the Co-Management Council, Core Groups and fishing community members.

For Tra O Lagoon, the application of the Co-Management model has been reviewed after two years (in July 2009). This review included all key groups in the Co-Management partnership arrangement. In particular, Core Group members who implement the Co-Management measures on the water were able to express their views on what and what not was working. This review process and feedback is critical to the ongoing process of monitoring the Co-Management model to ensure that the Objectives are being met.

In the application of Co-Management in Binh Dinh, and using the example of the three case studies, local communities are satisfactorily empowered through local regulations to undertake their management responsibilities. In all of these case studies, a holistic approach has been taken to the application of Co-Management. The background and supporting documents prepared by SAREP to establish the Co-Management models are not just focused solely on fisheries management outcomes. While these outcomes are critical to achieve sustainable fisheries management, they are described within the wider context of socio-economic goals, specifically poverty reduction and improved livelihoods.

2.3 Linkages and Institutions

There can be a number of stakeholders involved with Co-Management initiatives. For Co-Management to be effective there must be good linkages between these stakeholders and institutions that are involved in providing input to the Co-Management model. A stakeholder can be defined as anyone with an interest in the resource being managed and who may be affected by any management decisions or actions that are taken. These stakeholders include: local individual fishers, fishing households, aquaculturists, fishing community organisations.

In Binh Dinh, the Co-Management Councils, Core Groups, the local People's Committee and SAREP, form the partnership which is critical to the successful application of the Co-Management model. The linkages between the various groups in each of the case studies appear effective. There is a clear acknowledgement by each of the groups of their respective roles. There is regular consultation and properly organised and conducted meetings that reflect a professional relationship between the various parties. In addition other institutions, such as research organisations and other specialist organisations, can be called upon to provide research and specialist knowledge as appropriate. The linkages between SAREP and these organisations is well established.

2.4 Resources and funding

The fourth criterion for applying a Co-Management model is whether there are the resources to fully implement the model and for the Co-Management regime to be sustainable in the long term. According to Brown et. al. 2005, there are many examples of the application of Co-Management

models in the short term, but fewer examples of the long-term application of sustainable regimes. This is probably due to lack of resources over the long term, and after the initial set up and trial phase.

One of the initial criteria for establishing a Co-Management model should be that there is a resource sufficiently large enough to be worth managing. The model should apply to a sufficiently large area or size of fishery (or fisheries), that will eventually allow the Co-Management system to be self sustainable for continued operation and funding. For each of the case studies in Binh Dinh, there is a sufficiently large area, fisheries and fishing communities for each of the Co-Management models. Tra O Lagoon in particular offers an ideal set of circumstances for the application of Co-Management. The area is clearly spatially defined, has four well established fishing communities and the lagoon contains a variety of valuable fisheries resources. The Co-Management model has focused on a "whole fishery" approach, which includes all fisheries (freshwater eels and other fish species, shrimps, crabs shellfish etc.). The Nhon Hai and Ghenh Rang Co-Management models cover areas that are less well able to be spatially defined as marine boundaries for various fisheries are contiguous and overlap. However each model has established clearly defined areas for the application of the model. In the case of Ghenh Rang, the area to be managed by the local community is up to 6 nautical miles from the shore. Through regulation, the Ghenh Rang community has exclusive rights to fish and farm in these waters, and can control the activities of fishers from other communities from outside the area.

For Co-Management to be successful, the resources in terms of time (SAREP and community members), training (Co-Management Council and Core Groups), and field operations (Core Groups), is easy to underestimate. Research on one Co-Management model (quoted in Brown et. al. 2005) has put the cost of Co-Management as high as 27% of the total annual fisheries production, with 70% paid for by the Government and 30% by fishers. In this specific case, the compliance costs were very low and the largest share of the Government expense was information costs.

The ongoing funding of the Co-Management Councils and Core Groups is essential for the long term sustainability of the Co-Management models. A critical part of the Core Groups activities should be education, monitoring and enforcement. The effective enforcement of regulations (e.g.destructive fishing methods) and agreements (no fishing zones etc) to ensure fisheries sustainability is critical. Enforcement should be objective and independent of any personal interests or conflicts of interest between the Co-Management Council, Core Group members and fishing activities. For enforcement activities the Core Group should receive the active support of other enforcement agencies such as the Police and Border Police. Members of the Co-Management Council with specific responsibilities for enforcement should rigorously enforce the regulations concerning destructive fishing methods, and other regulations critical to the protection of fisheries habitat.

The initial set up phase of Co-Management models is largely funded by Government. The contribution by the Co-Management Council and particularly the Core Group is essentially voluntary. Maintaining and resourcing the Co-Management Council and the Core Groups over the longer term is essential for the successful continuation of the Co-Management models.

Using Tra O as an example, the Co-Management model has been in effect for two years, beginning in 2007. Arising from the review undertaken in 2009, it will be important to address the issue to establish funding sources to support the activities of the Core Groups. Under the partnership

arrangement, the Government and local authorities could assist in implementing any necessary regulations to implement any revenue generating system as required.

Co-Management can be considered as a method for implementing fisheries management within a specific area. The codes of practice associated with each Co-Management model are effectively "plans" for the management of the local fisheries resources. The application of the Co-Management models could be enhanced by the preparation of detailed Fisheries Resource Management Plans (FRMPs). These plans would contain the Code of Practice and also specify the goals and objectives for the management of the fisheries resources, and the wider socio-economic aims. These plans would be comprehensive by including all relevant information and knowledge about the fisheries and fish stocks. These plans would require the input and consultation with all stakeholders involved with the Co-Management model. The plans could be used to monitor and evaluate progress in meeting Goals and Objectives and achieving the desired outcomes.

3 Conclusions and Recommendations

1. Co-Management is effectively being introduced in Binh Dinh by SAREP to address the problems of resource management in small scale fisheries.
2. The Co-Management models being applied in three different areas meet the selected criteria for the effective implementation of Co-Management.
3. The long term success of the Co-Management models will be strongly influenced by the ability to provide a secure and long term funding base for the operations of the Co-Management Councils and Core Groups.
4. The application of the Co-Management models could be assisted by the development of Fisheries Resource Management Plans (FRMPs). These plans would clearly specify the Goals, Objectives and Action Plans. These plans would be used to evaluate and monitor progress of the implementation of the Co-Management models.

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ASSESSMENT ON FISHERY CO-MANAGEMENT MODEL IN EASOUP RESERVOIR AND LAK LAKE, DAK LAK PROVINCE

SUMMARY

Phan Đinh Phúc, Lý Ngọc Tuyên, Lê Văn Diệu, và Dương Tuấn Phương

The project of MeKong River Fisheries Basin Management – National Centre of Central fresh water fishery seed Production – Research Institute of Aquaculture III.

Dak Lak is one of the five Highland provinces, its inland fisheries is rather developed with over 500 reservoirs with the area of nearly 9.500 ha, and the numerous system of rivers and streams. According to DakLak statistic year book, the yield of inland capture fisheries in 2007 was about 1.400 tons and 5.500 tons of aquaculture.

The project of MeKong River Valley Fishery Management within Reseach Institute of Aquaculture No. III that was sponsored by MeKong River Commission and has carried out in Dak Lak from August, 1995 to now. From 1995, the project developed some fishery co-management models in Dak Lak provine. Currently the fishery co-management model in Easoup reservoir (established in 1999) and the Lak lake (2002) have existed and developed. Until now, with the project's support, the two models with the core of agro-fishery association in Easoup reservoir and Lak lake fishery association have implemented activities as awareness raising for community and local authority through trainning courses, workshops, meetings and study tours; fishery protection patrols; fising fees for association's income; establishment of saving credit groups to create community's capital sources; aquaculture to improve resources and community's income,… To assess exactly the models' effectiveness for long time of development and experience in establishment of other fishery co-management models in Vietnam, the project has carried out the act of "To assess the fishery co-management in Easoup reservoir and Lak lake, Dak Lak province" and the achieved results will be shown in this report.

1. CONTRODUCTION

Dak Lak is one of five Highland provinces, its inland fisheries is rather developed with over 500 reservoirs with the area of nearly 9.500 ha, and the numerous system of rivers and streams. According to DakLak statistic year book, the yield of inland fisheries exploitation in 2007 was about 1.400 tons and 5.500 tons of aquaculture product (Dak Lak Department of Statistics, 2008).

Lak lake in Lak District and Easoup reservoir in Easoup District, are the two ones with large fishery potentials in Dak Lak province. Aquaculture in the lakes has existed long time and their yield have recently decreased seriously because of increasing exploiting intensity and wide use of destructive fishing gear. Lak lake is the largest natural one in Dak Lak province with the water area of 658 ha, within Lak District and far from Buon Me Thuot City 56 km to the South-East. Lak brings the annual average income for 400 fishermen who live around the lake. Its fishery yield from 1998-2002 was over 100 tons of fish and shrimp per year, nearly 500 mill. VND. Lak is also a famous visiting place in Dak Lak. Easoup reservoir is in Easoup town, Easoup district, Dak Lak province. The reservoir was built in 1978 and finished in 1980. Its volumn is 7.5 mill.m^3 and the water area about 240 ha, with the main target of agriculture irrigation and flood regulation. Nowadays, it has brought many other benefits as food supply, works and income for fishermen around the reservoir.

In order to maintain stable fishery resources and improve the fishermen's living standard around the lakes, the project of MeKong River Basin Fishery Management established "Fishery co-management model" at these lakes. The Easoup Fishery sub-association officially went into operation from 12/1999 according to DPC's Decision and Lak lake Fishery Sub-association was established in 4/2002 according to PPC's Decision. To assess exactly the models' effectiveness for long time of development and experience in establishment of other fishery co-management models in Vietnam, the project has carried out the act of "To assess the fishery co-management in Easoup reservoir and Lak lake, Dak Lak province" and the achieved results will be shown in this report.

2. Research Method

- To collect relevant primary and secondary data

- To investigate the economic and social aspects of fishery by questionnaires.

- To interview fishermen and local staffs by questionnaires of "Assessment of co-management model"

3. RESEARCH RESULT AND DISCUSSION

3.1 The structure of fishermen organization around Easoup reservoir and Lak lake

Agriculture and Fishery Sub-association of Easoup reservoir was established in 1999 based on the Easoup DPC's Decision and belongs to Easoup Town Farmer Association (Nguyen Thi Nhung and collegues, 2003). The sub-association is directed by executive board of 9 persons including 1 Head, 1 Vice-head, 1 accountant, 1 cashier and 5 team leaders of 5 teams (1 female). Now, the sub-association has 62 members. The direct agencies that cooperate and support to the sub-association are Easoup Town People Committee, Easoup Town Police Station, Easoup Town Farmer Association.

Lak lake fishery sub-association was established in 2002 according to Decision N^0 1140/QD-UB, dated 26 April, 2002 of Dak Lak Provincial People Committee. It has own seal and bank account, is directed by executive board of 9 persons including 1 Head, 1 Vice-head, 1 accountant, 1 cashier and 5 team leaders of 5 team. It has 173 members including 81 of Kinh people, 92 of people from other ethnic minority. The direct agencies that cooperate and support to the association are Deparment of Agriculture and Rural Development and Lak District Agriculture Station.

3.2 Some activities' results of Lak lake agriculture and fisheries Sub-association and Easoup fisheries Sub-association

3.2.1 Raising awareness for fishery community and local authority

Activities of awareness raising for fisheries community and local authority are trainning, workshops and studytour. The number of participants in these activities in Easoup reservoir and Lak lake are shown in the below table.

Bảng 1: The number of training course, workshops and studytour held for fisheries community and local authority in Easoup reservoir and Lak lake from 1999-2008

Content	Easoup Reservoir		Lak lake	
	Courses/workshop /studytour	Participants	Courses/workshop /studytour	Participants
Trainning				
1. Technique of fishery exploitation	2	100	4	160
Technique of making fishing nets	5	120	5	150
2. Technique to aquaculture in pond, cage, reservoir	6	240	6	280
3. Technique of data collection and analysis	5	98	5	125

4. Environemental ecosystem – Fishery resources management	7	210	8	240
5. Skill of leadship, workshop organization, financial management	3	27	3	33
6. Saving credit	6	60	6	90
7. Aministrative penalty	2	18	3	27
8. Fishery Law	1	45	1	80
Total	**37**	**918**	**41**	**1.185**
WORKSHOPS				
1. Situation of fisheries in province	2	80	2	120
2. Reservoir fisheries co-management model	2	84	2	110
3. Experience of fisheries management	2	92	2	130
4. Experience of fish stocking in reservoir	1	60	1	65
5. To transfer the Easoup reservoir fisheries co-management model to local authority	1	45	1	50
6. To develop management plan and Easoup/Lak fisheries associations	1	45	1	70
Total	**9**	**406**	**9**	**545**
PLANTOUR				
1. Fising methods and making traps for shrimp fishing in Lak lake	1	40		

2. Eakao lake fisheries management procedures	1	20	1	30
3. Technique to aquaculture in small area in Lak lake	1	15		
Total	**3**	**75**		

3.2.2 To plan and review the farmer organizations' workplan implementation

Executive Boards of Easoup fisheries Sub-association and Lak lake fisheries Sub-association monthly hold meetings to recheck implemented works in the previous month and to plan activities for the next month. These meetings play a very important role in maintainning and developing fishermen associations. Besides, in the meetings, associations' financial receipt and payment was also reported clearly and transparently.

Table 2: Meetings of Executives Board of farmer associations in Easoup and Lak.

Year	**Quartly/annual meetings** (number/ participant)		**Monthly executives board meetings** (number/ participant)		**Monthly team meetings – 5 teams** (number/ participant, everage of 10 fishermen/team/Easoup and 40 fishermen/team/Lak)	
	Easoup	**Lak**	**Easoup**	**Lak**	**Easoup**	**Lak**
1999	1 time/40 persons	1/ 85	4 /32	4 / 44	5/ 50	5/ 180
2000	2 times/87 persons	3/120	12 / 96	4/ 30	9/ 450	5 /150
2001	2 times/81 persons	2/ 90	12/ 96	12/ 120	9/ 450	12 /210
2002	1 time/37 persons	3/ 150	12 / 96	12 / 108	9 / 450	10/180
2003	1 time/85 persons	2 / 120	12 / 96	12 / 108	9/ 450	7 / 190

2004	1 time/89 persons	2 / 160	12 / 88	12 / 100	10 / 104	5 / 200
2005	2 times/87 persons	1 / 80	12 / 84	12 / 96	9 / 450	6 / 180
2006	3 times/ 114 persons	3 / 150	12 / 83	12 / 120	9/ 450	2 / 120
2007	1 time/ 42 persons	1 / 70	12 / 80	12/ 84	9 / 450	2 / 90
2008	1 time/ 39 persons	1 / 70	12 / 91	9 / 81	5 / 150	3 l/ 90
TOTAL	**15 times/701 persons**	**19 times / 1.095 persons**	**112 times / 842 persons**	**101times/ 891 persons**	**83 times/ 3.454 persons**	**57 times/ 1.590 persons**

Beside executives board meetings of fishermen organizations, there were quarterly meetings (open meeting of executive board) or meetings for all fishermen. In these meetings, the executives board also presented implemented activities and the plan in the future of farmer associations (quarterly or annual review depending on meetings).

Team meetings are always held to develop the team's plan and publicize the association's finance.

3.2.3 Patrol and protection

After establishment, sub-association of Easoup fisheries and Lak fisheries association all established their sercurity teams.The sercurity teams cooperate with district or town police station to patrol, prevent and find out breaks of regulations of fishermen associations and State's Law on fishery exploitation. Until now, Easoup has consficated 56 electro net, 18 batteries and 12 boats and Lak, has seized 84 electro nets, 25 lift nets and 9 boats.

Table 3: The sercurity teams's result of Easoup fisheries sub-association and Lak fisheries association.

Year	Easoup reservoir		Lak lake	
	The number of patrol	**Participants**	**The number of patrol**	**Participants**

1999	8	40	0	0
2000	25	75	8	83
2001	23	65	9	102
2002	24	60	8	93
2003	26	85	7	81
2004	24	105	6	70
2005	24	120	8	40
2006	18	90	6	42
2007	16	80	2	12
2008	15	75	2	10
TOTAL	**203**	**795**	**56**	**533**

By patrolling well, the use of electric gear has reduced significantly at Easoup reservoir in comparison with the period without sub-association (reduced 90%). In Lak, although the association has organized the patrol team, due to wide and complicated area the use of electric gear aslo reduces but it is still problematic.

3.2.4 Charging to create the income resources for fishermen organization

Income resources of fishery associations include subcription, protection fees, shares, eploiting fees, aquaculture fees (Easoup Reservoir).

Table 4: Financial situation of Easoup fisheries sub-association

Year	Money from members(VND)	Pay for activities (VND)
1999	700.000	Pay for activities of protection, salary for excutives board, stationery, annual seed purchase and other expenditures of sub-association. Until now, (Oct 2009) its cash
2000	8.756.000	
2001	4.410.000	
2002	11.940.000	
2003	11.440.000	

2004	8.550.000	balance is 10.500.000 VND.
2005	9.904.000	
2006	10.800.000	
2007	19.200,000	
2008	11.940.000	
2009	10.500.000	
Supported from MeKong Project	15.000.000	
To raise shares from fishermen (50.000 VND/person)	250.000	
Total	**85.000.000**	

Table 5: Financial situation of Lak fisheries Association

Year	Money from members(VND)	Pay for activities (VND)
2001	3.995.000	Pay for activities of protection, salary for excutives board, stationery, cost for culturing in small areas and other expenditures. Until now, (Oct 2009) its cash balance is 8.275.000 VND.
2002	7.703.000	
2003	5.800.000	
2004	11.605.000	
2005	4.567.000	
2006	5.720.000	
2007	4.140.000	
2008	13.880.000	
2009	315.000	
Received from the MeKong's project	29.660.000	
Raise from fishermen's share	37.000.000	
Total	**97.686.000**	

3.2.5 To create income resources for fisheries community through saving credit.

After the training course on "Procedures of credit and saving activities", the association established credit and saving groups with the volunteer participation of many members. Its aim is to support inhabitants in self-mobilizing capital to change career, to do side-work, fishing gear investment, to help each other in life to reduce exploiting pressure, to make closed relationship in community. Starting by a small capital, now credit groups has supplied rather high loans to members with simple procedures to invest in household economic activities.

Table 6: Some results from credit and saving activities of Sub-association of Easoup Fisheries and Association of Lak Fisheries (Nguyen Thi Tu, 2005)

Year	Easoup		Lak	
	1999-2003	**2004-now**	**2002 - 2004**	**2005 - now**
Number of member	31 fishermen	25 fishermen	53 fishermen	24 fishermen
Money contributes monthly, VND	20.000-30.000	50.000	20.000 - 30.000	50.000 - 100.000
Sum of money for loan (mill. VND)	0,5 - 2,0	0,5 - 3,0	0,5 - 2,0	0,5 - 7,0
The number of people receive loans	51	40	29	76
The total money loaned, VND	26.620.000	39.180.000	15.142.000	57.160.000
Total capital, VND	14.000.000	21.500.000	12.800.000	45.700.000

3.2.6 Stocking to improve the resources

To maintain and improve the fish yield in researched waterbodiesb and increase member's income, fish stocking of the Easoup sub-association in Easoup reservoir from 2001 to 2008 was 11 times with the total of fish shown in below table. The result of fish stocking at Easoup reservoir was valued by farmers and it contributes to improve the exploiting yield and farmer's income.

Table 7: Some activities of fish stocking in Easoup Reservoir from 2001 to 2008 (Fisheries Management Project, 2008).

Year	**Quantity of breeding fish** (kg)	**Size** (piece/kg)	**Sum of money** (VND)	**Size** (cm)	Species
2001	268	160-250	8,756,000	4-6	Grass carp, common carp, Barb, tilapia,
2002	129	180-250	4,410,000		
2003	215	160-250	11.940.000		
2004	230	300-400	11,440,000		
2005	232	200-300	8,550,000		

2006	198	120-160	9,904,000		
2007	210	180-280	10,800,000		
2008	400	140-160	19,200,000		
Total	**1,882**		**85.000.000**		

(Note: The fish stocking money in 2003 added the value of local fish that was supported by AIMS project. !5 mill. of stocking fish in the total 85 mill. in which 15 mill. came from FMG project and 70 mill. was from members of Easoup Fishery Sub-association.

In Sep 2004, Lak Fisheries Association seperated 30 ha belonging to Cay Kho area to aquaculture. To May 2005, all preparation works as: fence construction, compilation of regulations on management and exploiting, seed expenditures, protection activity,… were finished. On 16, July 2005, the association stocked 450 kg of fish seed including Grass carp, common carp, Barb. However, the fence was not safe enough so fish went out and a large quantity of fish was stolen. Due to culturing in small areas which is not effective so that people did not continue this method.

Table 8: The quantity and species in small area of Cay Kho, Lak lake.

N^0	Species	Quantity of breeding fish (kg)	Total (kg)
1	Silver barb	120	290
2	Barb	120	363
3	Carp	60	86
4	Grass carp	60	1.030
5	Troi	50	993
6	Common carp	40	206
Natural fishes			1.594
Total		**450**	**4.562**

3.3 To analysis disadvantage, advantage, challenge of the fisheries management by co-management approach in Easoup reservoir and Lak lake.

Table9. Disadvantage, advantage, challenge of the fisheries management by co-management approach in Easoup reservoir and Lak lake

Disadvantage	Advantage
- The awareness of authority, community and stakeholders in fishery resources management changed. The role and responsibility on resources	- Most of local community and stakeholders had low awareness and consciousness leading to impact on co-management

management of inhabitants, local authority and stakeholders were defined clearly. - Inhabitants had rights to take part in the process of decision making, implement relevant to fisheries management in province. - Inhabitants took part in process of fisheries management (patrol, breeding, exploiting charge, election of Executive Board, training to improve the awareness and management skill,…) - To gather the strength of the State and citizen to protect resources. - To reduce the burdens of resources management for local authority and to save the mangament cost. - To increase democracy in fishery resources management (citizen's recommendation was sent to authority timely, to create conditions for them to contact local leaders and other stakeholders).	activities. - Easoup fishery co-management model and Lak model were career associations so they did not have enough power and skill on fishery management in case of lacking local authority's participation. - Difficulties in economic aspect of fishery community impact on co-management activities. - Lack of development-supported capital. - Local community had depended on the support of the project and State. - The individual's role in these models was limitted, mainly association leadship. - "Criticize much more than act" was popular in most of fishermen community. - The bureaucratic management procedures was deep in inhabitant and local authority's mind. - The project plays a very big role in the existence and development's models.
OPPORTUNITY	**CHALLENGES**
- The State pays attention on the community co-management model. - The awareness of inhabitants, local authority and sector agencies is improved step by step. - The State much concerns of the protection of national fishery resources. - Fishery programs to eliminate hunger and reduce poverty and others are interested by the Sate.	- The market economic mechanism impacts strongly on the fishery co-management models' existence and development. - Currently the fishery sector that has been considered as minor and not been assessed its importance and development potentials. - To relax the fishery resources management impacts badly on the fishery resources and fishery co-management activities. - As Mekong fishery management project came to an end that will influence on the model's existence and development.

Resource: Phan Đinh Phuc and collegues (2007).

3.4 The general assessement on Easoup and Lak co-management models.

3.4.1 The general assessement

- The models in Lak and Easoup lakes are the community-base co-management models.

- Easoup model is more stable and sustainable than Lak one.

- Easoup model can exist as the Fishery Management Project– Mekong River Commission – cuts off its support.

- To sustainable and effective aspects, Easoup co-management model is more sustainable and effective than Lak one, as some following factors:

+ The management scale is more narrow than Lak with the area of 240 ha, inhabitants around the reservoir (in the past belonging to Easoup town and Cu M'lan Commune) include many groups of people, most of them are Kinh people, some of them are Tay, Nung people. While, Lak lake's area is 658 ha, surrounded with Lien Son town and 3 communes: Yang Tao, Đắk Liêng and Bông K'Rang. Almost of inhabitants around the lake is native people (M'nông, Giarai, Ê đê...);

+ Most of fishermen community is Kinh people with the equal awareness. They understand the role of sub-association and their role in the fishery management in Easoup reservoir.

+ Members of sub-association of Easoup fishery's leadership are more skilled, enthusiastic, interested in fisheries, fishery resources than the Lak's leadership.

+ There is the agreement in development and implement of plans and others activities (rate of charge, allowance of patrol, meeting organization, …) among members.

+ Sub-association has own finance resources to maintain and carry out activities through exploiting charges, patrol charges and member fees.

+ Sub-association's meetings are held periodically to control, assess and implement plans.

+ There are attentions, active support from local authority.

+ Most of members obey issued regulations, management measurement,…

+ The members' living standard is improved and stable.

- The results from the project's interviews show that:

+ In Easoup reservoir, over 80% of interviewees said that the model has been still developed and operated well as external supports are cut off, the Lak's number is 67%.

+ 83% of its members commit to keep sharing money or work to maintain the model's regulation and activities.

+ In interview, all local staffs in two districts with developed models agree with the achieved results. To each member, most of interviewee (83-100%) in Easoup association agrees with the model's result while 67% to Lak association.

3.4.2 Questionnaire-based assessment

The questionnaire of "To assess the co-management model" in Lak and Easoup lakes based on the SCAFI project's one that is compiled by Institute of Fishery Economics and Planning (is adjusted to be suitble). The project's survey results are compared with the survey results implemented by

Institute of Fisheries Economics and Planning 2007 (Nguyen Thi Hong Van, 2007; Tuong Phi Lai, 2007).

Table 10: Assessed points according to questionnaire on Easoup and Lak co-management assessment.

N^0	Assessment Unit	Time	Number of question	Total of maximum point	Easoup		Lắk	
					Point	% pass point/ maximum point	Point	% pass point/ maximum point
1	Institute of Fishery Economics and Planning	8/2007	56	168	105	62,5	79	47,0
2	Project of Fishery Management	9/2009	54	162	129	76,8	95	58,6

3.4.3 The effectiveness of Lak and Easoup co-management models.

Some effectiveness of Lak and Easoup co-management models are assessed by the community and local authority, as follows:

- The awareness and management skill of fishermen and local authority are improved.

- The effectiveness of fisheries management is enhanced (Phan Đinh Phúc và CTV, 2007)

- As investigated results, the average income rate and profit of household and Association of Easoup Fisheries for two stages are shown in the below table. The results show that the household's income rate in the period of 2006 to now has been increased significantly.

Table 11: The average income rate of households in Association of Easoup Fisheries.

Year	**Average income** (mill.VND/year)	**Average payment** (mill.VND/year)	**Received profit** (mill.VND/year)
2001	9,8	12,1	- 2,2

2006 – now	25,2	16,8	+ 8,4

3.5. Lesson-learnt on fisheries co-management from Easoup and Lak lakes.

The first lesson-learnt: Fisheries co-management approach can not success if the awareness of fisheries resources protection of community and local staffs is low; and the role of the State is not equal to the inhabitant's one in the resources protection.

The second lesson-learnt: Fisheries co-management approach needs long time for community and local staffs who reach the high awareness and the awareness improvement must be done continously.

The third lesson-learnt: The capacity and individual role of community leader are very important in the establishment of fisheries co-management.

The forth lesson-learnt: The community's economic condition impacts significantly on the establishment of fisheries co-management.

The fifth lesson-learnt: Fisheries co-management approach easily successes with the waterbodies which have rather plentiful fishery resources, community received rather big profit, potential of increasing fish yield and increasing the community's income.

The sixth lesson-learnt: Co-management model will reach the high sustainability if it receives the support and consultancy from individuals, organizations that have capacity of professional and fisheries management for the at least 5 years from the begining.

3.6. Recommendation

- Two co-management models in Lak and Easoup lakes have been developed for long time. Currently the Easoup co-management model has been reached specific results and sustainablity. The community and local authority confirm that the co-management model in Easoup reservoir will be maintained and developed after the Mekong fisheries management project finishes its activities here. The model in Lak lake is not sustainable so in the next time it has been still needed the support from the project and local authority.

- Need to expand the fishery co-management and fisheries resources at reservoir in Vietnam.

- The State and local authority at all levels need issue legal documents to specify responsibility and role of State agencies in participating in fisheries co-management model in locality.

- The State needs to have policies on financial support for co-management models that has been developed and will be developed.

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APPLICATION OF FISHERIES CO-MANAGEMET IN BINH THUAN

Dr. Luong Thanh Son – Binh Thuan DARD

Fisheries in Binh Thuan as similar to another provinces in Vietnam which are small scale , multi species from molluse in coastal areas to commercial spcies in the open sea as tuna, markerel.

After many years of increasing fihing efforts, now marine fisheries recourses in coastal areas are declined. Some plentiful species are now in danger of unhabilitation. Local people's lives and livelihoods are more difficult due to low efective production.

Though local authorities have tried their best effort to propose solutions for resource protection, but it is due to the pressure of local fisherfolk livelihoods; the resources and local livelihoods have not been improving much, even worse.

Application for a more appropriate such as fisheries co-management is concerned to implement in recent years by organizations, individuals and local authorities.

With specific activities implemented as surveys, interviews, consulting from experts, using analysis tools, statistics; this paper is to introduce and share information on approaches and implementation of fisheries co-management in Binh Thuan provincefrom 2005 up to date. Hopefully, Binh Thuan province could learn and inherit the advanagesfrom co-management approach for coastal fishery management in the future.

1. INTRODUCTION:

Binh Thuan is coastal province located in Central South of Vietnam, the province has 192 km coastal lines with EEZ of 52.000 km^2. Binh Thuan sea area considered as one of the biggest fishing ground in Vietnam. Fishing capacity of vessels in the province calculated up to 6/2009 is 9.086 vessels/539.643 hp. Annual total of marine catch is about 165.000 ton.

Under the pressure of socio-economic development at province, marine resource declined; lives of fisherfolk are unstable and difficulty in production.

In Vietnam, fisheries co-management has just known in recent years and pilotted in some provinces. Binh Thuan province has studied to apply this approach to fisheries management. The author of this paper would introduce and share approaching activities and implementation of fisheries co-management in Binh Thuan since 2005.

2. Essentials for apply co-managed fisheries in coastal areas of Binh Thua province:

In recent time, though local authority and sectors have tried to strengthen management measures to sustain fisheries resources, pressure for food and livelihoods of fisherfolk, resources and local people lives have not been approved and it is difficult to ensure the requirements for sustainable development, details:

- *coastal resources declined:* many marine species are reduced; fishing production per unit of fishing vessel effort is continuously reduced; many species now become rare; fishing capacity per m (evarage fishing production reduced from 0,61 ton/cv in 2000 down to 0,31 ton/cv in 2008 (about 41 %).

- *unbalanced between fishing capacity and resources:* numbers of fishing vessels in the province increased from 4.591 in 2000 to 9.086 in 2008 (increased 1,98 times), horse power increased from 180.756 in 2000 to 539.643 in 2008 (increased 2,99 times) while fishing production is continuous reduced (figure 1).

- *Lives, occupations of fisherfolk are difficult, unstable due to low effective production.*

- *Protection of fisheries resource is ineffective:* inspection force for fisheries is not enough to control every sea area and at anytime; many fishermen are sneaky, with no choice for livelihoods, to violate regulations on fishery resource protection for maintain their lives. As a fact, fishery inspectors in Binh Thuan are quite many and well equipped, every year they treat nearly 200 violating cases (in 2005: 2.195 cases, in 2006: 1.730 cases; in 2007: 1.280 cases; in 2008: 1.943 cases) but the violations of regulations on fishery resource protection, including environmental conditions and marine ecosystems have not been improved in the province....

While the Government and Party put forwards policies of mobilization of local community participation in fisheries resource protection; co-management approach shows its success and appropriation to many international and regional countries.

In a survey in 5/2008 in 3 fishery communes in Binh Thuan done by a co-management task force showed that consensus and readiness from local communities participating with the authorities in fishery resource management reached very high accounting for 96,2 % (total of people being surveyed was 106).

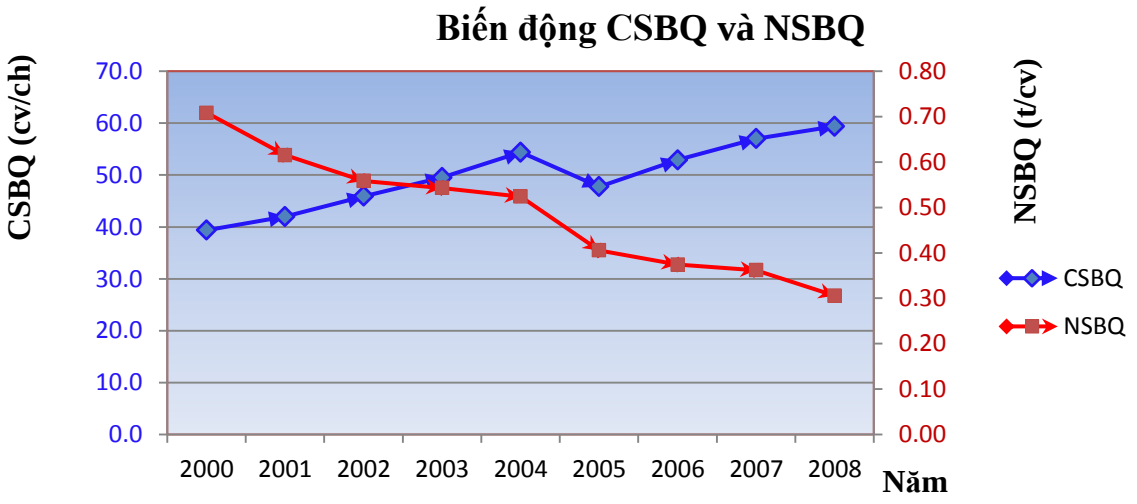

Figure 1: Changes on everage capacity per vessel and per unit of productivity by years.

2. Approach and implement fisheries co-management in Binh Thuan province:

Up to now, fisheries co-management arrangement in Binh Thuan is in proposing period. Approaching and implementing activities in recent time include:

2.1. Dissemination and awareness raising:

Annually, fisheries sector coordinates with local authorities, relevant agencies to organize many activities for disseminating enforced legal documents in relation to participation role of local comunities in fishery resource protection and management such as: Fisheries Law; Decision 131/2004/QĐ-TTg on Programme for fisheries resource development and protection to 2010; Decision 10/2006/QĐ-TTg on Master Planning of fisheries sector to 2010 and orientation to 2020; Decree 123/2006/NĐ-CP on management of fishing operation in sea areas;....

Dissemination programmes including: training workshops (about 15 courses/year); develop Posters; develop leaflets (from 5.000-7.000 leaflets/year); using mass media (speakers at communes, hamlets), radio and television system, articles, reportages (2 reportages/year); traing courses;...

Organize scientific workshops to discuss and collect ideas from national and international specialists and scientists, managers on possibility and methodology of applying for participatory community management for fishery resources in Binh Thuan (organize 2 workshops in 2005, 2006).

Send staffs to attend training courses and workshops on fisheries co-management in order to develop capacity, learn and share experience on the field.

Implement surveys and discussion with fisherfolk in the province: Duc Long ward, Mui Ne (Phan Thiet city), Hoa Thang (Bac Binh district), Chi Cong commune (Tuy Phong district) to collect information and their ideas on possibility of applying co-management appoach to coastal resource management in Binh Thuan.

2.2. Develop programmes and projects:

Develop programme on fishery resource development and protection in Binh Thuan to 2010 which was approved by Provincial People Committee at Decision no. 429/QĐ-CT-UBBT dated 21/02/2005; the programme refered many contents related to research and apply for measures of fishery resource management in term of authority and local community join to implement.

Develop project *"pilot co-mangement model on fishery resourse management in Hoa Thang commune, Bac Binh district, Bình Thuận province"*(on 03/12/2007 PPC issued Decision 3090/QĐ-UBND to approve outline and estimate budget for project development). The project proposal already finalized and submitted to PPC, MARD for consideration to implement. If the project was approved and implmented, it is a good opportunity to pilot fishery co-management model in the province; and learn from experience to apply in whole province.

3. Difficulties in implementing fisheries co-management:

Up to now, there has not been implmenting co-management in Binh Thuan province. However, process of study, surveys and discussion on developing co-management, the author have some ideas and interests to share as follows:

3.1. Characteristics of co-management model in coastal areas:

Co-management is a new approach and applied in some provinces in recent years. However, most of model implemented in Vietnam is in inland, bay, lagoon…but there is not implemented in coastal areas (open area). Binh Thuan is required to implement fishery co-management model in coastal areas. Therefore, process of developing model is new due to the characteristics of coastal areas different from inland, bay, lagoon areas, differences are: implemented sites could not be resident areas of local people; legal framework to identifya and allocate sea areas to local organizations; relationship between local community organizations and outside groups; organizational structure of local groups and relationship between local organizations and authorities...

3.2. Awareness of local people and local leaders:

As mentioned above, co-management is a new approach, it therefore has many unclear issues, including method of implementation, organization of operation, legal framework, real effectiveness,...So it is not easy to persuade loal leaders on the issue or change their thought and understanding on co-management in order to get their support, consensus and change old style of management.

For fisherfolk: it is also not easy on how to make local people understand on fisheries co-management and their role and duties as involvement due to limitation of knowledge. On the other hand, they still bear in mind on cooperative period and they doubt the approach that is also issue of cooperation and coordination with local authorities for natural resource management.

3.3. Legal framework to support co-management is inadequate and specific:

As a fact, some legal documents and orientation for fisheries sector develoment have mentioned to the role of communities in participating in fisheries management (Fisheries Law; Decision 131; Decision 10; Decree 123;...). However, the implementation of these documents is still very limited or without specific guidelines. It is just on orientation. So it is main reasons for local leader face difficulties in making decision on co-management implementation.

3.4. Identifying borderline and decentralizing water area:

Up to now, identification sea borderline between provinces has not been implemented by local authorities; it does have specific regulations on which competent agencies take responsible for processing dosiers, procedures to assign sea areas for organizations and individuals to implement co-management. While one of the essential conditions for co-management is to identify borderline and assign sea areas for local organizations. Therefore it is very difficult practically.

3.5. Issues on organization and operation mechanism of local organizations in relation to management agencies and economic transaction:

Presently, it has not had a specific guideline on forming organization, apparatus and the relation of local organizations and management agencies as well as economic transaction. So it is very difficult to identify legal framework for implementing activities of local organizations, particular when appearing conflicts between local organizations and other civil organizations. This also affects sustainability of pilot co-management models after phasing out (which organization will govern; what legal framework is based on;...).

3.6. Financial issues for implementing models:

Though Government and MARD have Guideline on implementing fisheries co-management and have programme to support (Programme 131), it is a fact that many provinces have not approached to the government fund for this programme (Programme 131). Therefore, it is very difficult to implement models, projects on co-management while financial sources at local level are still limited and difficult.

4. Exchange ideas and proposals:

Small scale fisheries co-management is a new approach which has been implemented in provinces with different models. According to author, up to now there has not been any report to assess on effectiveness and appropriation of models in Vietnam, but co-managemet approach with its advantage is to mobilize strength from stakeholders to involve in management, exploitaiton and use fisheries resources as well as protection of ecosystems in assigned areas; identify general points of stakeholders to share responsibility and benefits. Thus this approach could bring effectiveness for management, protection and development of fisheries resources and environment in the integration as well.

To approach and implement small scale fisheries co-management in coastal areas, according to the author, it needs to solve difficulties and shortcomings as mentioned above.

- *For identifying borderline and assign use rights for water areas:* based on requirements and management capacity of local organizations, available waterbodies and related conditions, competent agencies (PPC, DPC) issue decision to assign appropriate water areas for local community to manage. Decision to assign water areas is quite limited compared with certificate for land users' rights (Red book), but it is a legal base for local community to implement their management function in assigned water areas.

- *For local organization:* firstly, it needs to study and follow Decree 151/2007/NĐ-CP dated 10/10/2007 by the Governemtn on organization and operation of cooperatives. People committee of wards, communes assigned water areas will be considered to establish and take responsibility for supporting legal framework for economic transaction.

Some proposals on approaching and implementing small scale fisheries co-management:

1) Ministry of Agroculture and Rural Development needs to have specifically national programmes and plans (including financial issue) to develop and implement fisheries co-management nationwide; At the same time, it needs to have responsible ***organization*** on this issue to guide and support and assist technical and financial issues for implementation.

2) Guidance needs to be stronger (stronger than official letter 1700/BNN-KTBVNL dated 16/6/2009 by Ministry of Agriculture and Rural Development on implementing small scale fisheries co-management in coastal areas.

3) Propose Government ot direct relevant ministries and sectors to coordinate with Ministry of Agriculture and Rural Development to develop and finalize institutional, policies and regulations related to small scale fisheries co-management, particular assigning water areas; operation mechanism of local organization in relation to management agencies to implement socio-economic transaction.

4) Look for funds to support local level to apply and implement small scale fisheries co-management in coastal areas.

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International Collaborating Centre for Aquaculture and Fisheries Sustainability (ICAFIS) | Vietnam Fisheries Society (VINAFIS)
Email: infor@icafis.vn Website: http://icafis.vn/

WELL-ORGANIZATION OF CO-MANAGEMENT ON SUSTAINABLE DEVELOPMENT OF COASTALINE RESOURCES IN BEN TRE PROVINCE

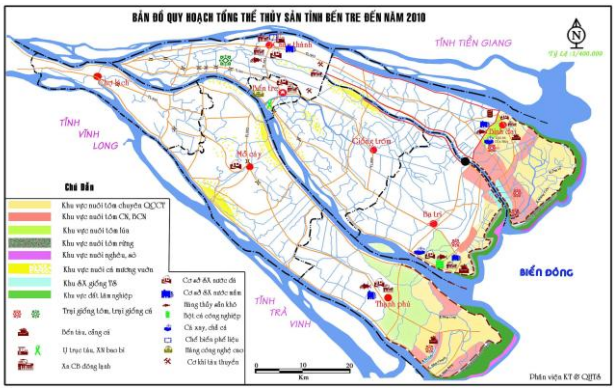
Ms. Tran Thi Thu Nga

Vice-Director, Department of Agriculture and Rural Development of Ben Tre Province

Part I. INTRODUCTION

I. Geography

Ben Tre, the land is at the end of Mekong River closed to the South China Sea with four estuaries: Tien Giang, Ba Lai, Ham Luong and Co Chien; its coastline is over 65 km and sea-territories over 26.000 km^2; Biodiversity system of the esturary is plentiful (over 280 kinds of unicellular alga, 96 kinds of aquatic animals, 16 groups of aquatic species; over 7.130 ha of coastal mangroves with 3.250 ha being preserved,…) that is good condition to develop fishery aquaculture and exploitation. Coastal inhabitant community for hundreds of year do the traditional career to live and to carry out revolution through periods of national liberation and construction.



II. Opportunities and Challenges:

Opportunities*:* received the concern from Party and State agencies at all levels, socio-economic and scientific organizations to the coastal fishery resources development and protection as well as improving living standard of community in many fields: infrastructure investment, awareness enhancement, cooperatives, co-management knowledge, food safety and hygiene, environment geodesy, resources preservation, harvest control of molluse, MSC criteria,...

Challenges: the number of coastal fishing boats/vessels is rather large with many kinds of fishing gears, mesh sizes are not suitable; policy and mechanism and management forms are not effective;

clam robber has happened in some weak management cooperatives leading to fishery resources damaged, impact on the development process of biodiversity system, ecosystem balance, social security and economic and cultural community life.

Part II. DEVELOP CO-MANAGEMENT MODEL OF CLAM EXPLOITING AND MANAGEMENT COOPERATIVES IN BEN TRE PROVINCE

The management model of cooperatives that manage and exploiting clam in Ben Tre province is the model which the State shares some rights to local community to manage, develop and exploit the natural clam resources in the coastal area of Ben Tre. Such as: to give the land-use right of alluvial area to manage and exploit natural clam; to manage and use labourers who are members of cooperatives in clam management and exploitation activities; management of financial expenses according to Budget Law, Cooperatives Law and regulations and action mode which are approved by members or representatives from cooperatives in festivals.

I. Establishment of management mechanism and system of clam cooperatives in Ben Tre province

Before 1980, clam aquaculture was still unplanned career, inhabitants only used natural clam area to pick up clam as food or product to sell in rural markets or exchange into salt, rice, other kinds of food to cover their family life. At the end of 1980, some Hong Kong and Taiwan businessmen investigated and purchased clam through fishery export and processing enterprises but small scale (afar trade) then movement of natural clam aquaculture started to develop. They collect clam from natural clam seed area in Thanh Phong – Thanh Phu, Thoi Thuan, Thua Duc - Binh Dai to aquaculture in near areas with large scale and yield according to market demand in some Asian nations as boiled and frozen clam.

With the feature of biological reproductive resources but easily damageable, the resources can be exhausted, the natural environment will be degraded if inhabitant community do not combine resources exploitation with protection. Otherwise, clam is also valued exported fishery product if it meets criteria of food safety and hygiene by strict control and management process according to the international quality control system. To poor coastal inhabitants community, clam is also developed object that is suitable to the aim of hunger elimination and poverty reduce because of easily aquaculture, little disease and low investment. Therefore, if the right of management and exploitation is given to individuals leading to conflicts and difficulties in resources controlling and harvesting and preservation process.

Basing on above specific factors, PPC has policy on establishment of clam management and exploitation cooperatives to manage natural resources that is valuable, export value and high effectiveness to programs of hunger elimination and poverty for coastal fisherman community to do well control processes and organize the profit share to poor fishermen community, to pay taxes and to decentralize the management of cooperatives' activities to CPC.

As province's policy, some areas has took this opportunity to establish cooperatives, fishery cooperatives to manage and exploit the valuable natural resources as Thanh Phong – Thanh Phu, Thoi Thuan – Binh Dai,…. then these cooperatives were broken continuously and the resources has been destroyed. The reasons: fishermen's life is too poor, management staffs are not much experienced, management procedure is subsidized strongly, unstable market, other inhabitants near the area also came to exploit meat clam and seed clam in cooperatives' clam area and sold with very low price of 300-500 VND/kg of meat clam to have short-term interests.

Until to the middle of the year of 1990, provincial cooperatives association was established to manage the cooperatives' activities according to the Law of Cooperatives, including fishery cooperatives. So the association cooperated with Department of Fishery in planning re-organization of clam management and exploitation cooperatives in the province. By many management models, festivals were held, the head of cooperatives was elected, the procedure of profit distribution to members but cooperatives' activities were still unstable. The main reason is the management staff's ability is not suitable to the task, the mechanism of public and democracy is not implemented fully and equally, unsuitable profit distribution long lasted so it did not received the agreement from members.

Understanding the above reason, provincial authority established the steering committee to strength cooperatives with participants: representative's head committee of the provincial cooperatives association, director committee of Department of Fishery (now Department of Agriculture and Rural Development), DPC, CPC. They participate in all steps from collecting farmer's suggestion through self-managed people teams to each hamlet, commune on member development scale, personnel election to the head committee of cooperatives as well as its interest distribution.

The steering committee and the head committee of cooperatives re-unify the management organization, development scale and the way of interest distribution. Until July, 1997, the new kind cooperatives Thoi Thuan – Binh Dai officially was established with the name of Rang Dong Fishery Cooperatives. Its feature is mobilizing all household in commune to part in cooperatives with the main function of clam resources exploitation management and consumption on the area of 900 ha of coastal tide area that was temporally distributed to solve work for labourers, suitable interests distribution and increase income, improve member's living standard as well as speed up the provincial socio-economic development.

New established production and management procedures basing on the co-management mechanism and public and democratic principle, that are implemented strictly by the committee of Head's cooperatives, have brought high agreement from thousand of members.

II. Management and organization system by co-management model of clam cooperatives in Ben Tre province:

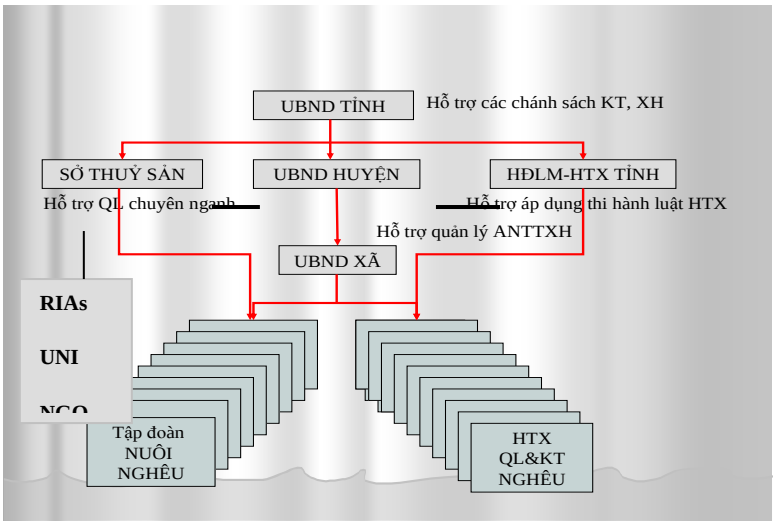


Diagram of management organization system of cooperative and Clam Management Group in Ben Tre.

The above diagram shows that the high and closed concern from sectors, levels to clam aquaculture and exploitation community in Ben Tre, specially:

Government and Ministries: issued the Law of Cooperatives, Law of Minerals and Resources, Law of Fishery and guidance by management ministries …. Have affected on enhancement of legal consciousness to aim at sustainable development; have also shown some basic rights of cooperative economic organization in production to promote and protect community's interests.

Provincial People Committee: decides policies on land, forestry distribution for cooperatives to manage and exploit; issue the mechanism of interest distribution, living standard improvement for community; issue decisions on management and exploitation focusing on resources preservation, protection of environment human ecosystem…

Functional sectors cooperating with district people committees: provide advice to PPC to develop suitable policies for protection and reproduction of resources, environment, human ecosystem and community development.

People committee of districts: carry out and control the implement of the State's policies to cooperatives, of social order stabilization, implement co-management to enhance responsibility, to protect legal interests and to improve community's living standard.

The Head committee of cooperatives: manage and exploit resources to legal regulations and guidance documents of specific agencies. To distribute interests and manage labourer basing on co-management mechanism, to do given tasks from specific agencies and to ensure legal, equal, public and democratic principles.

III. The effectiveness of co-management model with the form of clam management cooperatives in Ben Tre province:

Resources, natural resources, ecosystem, … are preserved and developed durably.

The application of product harvesting controlling process and forecasting environment survey bring higher and higher production effectiveness.

Organization machine and mechanism of interests distribution are legal suitable and democratic.

Community's interest is shared basing on the principle of transparency, public to receive the high agreement in community.

The income of community increases day by day, problems of sex equality and children right are focused on by cooperatives and authority at all levels.

To absorb investment capital to develop infrastructure and expand market. The socio-cultural life is improved day by day.

The ceremony of 10 year-establishment of Rang Dong cooperatives

Cooperatives' social activities

The effectiveness of new cooperatives model as Rang Dong cooperatives has absorbed concern from leaders and representatives of government and international organizations who have come and visited the cooperatives, highly appreciated the model as the advanced one to be introduced to other communes and provinces in our nation. Rang Dong cooperatives has received many prizes, diploma of merit, labour decoration from Party, State, Trade Union's organizations and Association at all levels. Its model is considered as typical one from 1997 to now.

As Rang Dong Fishery cooperatives, Dong Tam-Binh Dai Fishery, Bao Thuan, Bao Thanh, Tan Thuy, Lac Dia – Ba Tri; Binh Minh, Doan Ket, Thanh Loi, Hai Duong, Phong Hai-Thanh Phu; Vinh Tien-Cho Lach was established. At the end of 2006, Ben Tre has 13 fishery cooperatives and clam aquaculture groups with 9.744 member households that produce stably in districts: Binh Dai, Ba Tri, Thanh Phu and Cho Lach; the given land area of 7.800 ha in which 4970 ha is exploited and harvested. The remaining area has not been exploited fully as the lack of seed, capital, moreover some

cooperatives are weak in management, protection of clam area, the effectiveness is low so they dare not to expand the aquaculture area.

During the development process fishery cooperatives have always received the concern from leaders of province, the ministry and other sectors at all levels. Many policies, projects and scientific research programs that is cooperated to carry out by institutes, universities, interior and foreign socio-economic organizations and Ben Tre Fishery sector, as:

Policy:

PPC distributed land to cooperatives to manage and exploit (1997); Taxation Bureau imposed to reduce the business income tax (2004); the provincial association of cooperatives operated according to the Law of Cooperatives (1997); Department of Fishery guided to apply co-management mechanism (2003); provincial association and department of fishery (Department of Agriculture and Rural Development) guided to establish association of cooperatives (2008); to train skill of management and control in harvesting, disease, environment, finance,….

Mechanism:

+ Management of environment and resources: Beside application of the Law of Fishery, Law of resources and mineral, Law of cooperatives; provincial fishery cooperatives carry out specific regulations as: regulation of Department of Fishery (1997) on the ratio, size and harvest seed and meat clam exploitation; regulation of PPC (2001) on mangrove forest preservation; regulation of Department of Agriculture and Rural Development (2004) on hunting wide animal…

+ Management of food safety and hygiene: on 7, Jan 1997, the Ministry of Fishery issued control mechanism on Safety and Hygiene of harvesting area of mollusk, assigned task to NAFIQACEN on cooperation with Department of Fishery to develop program in Tien Giang, Ben Tre. In March 2000 EU certified Vietnamese control program; it is the foundation that Ben Tre clam to be exported to America, Japan, Korea,… until now.

IV. Lesson learned from the co-management model of clam management and exploitation cooperatives in Ben Tre.

- Need to have support from the Party, State agencies at all levels, functional sectors and time to mobilize fishermen's response to implement the sustainable development program of natural resources.
- Need to develop community-based management model according to co-management model mechanism to create the high agreement from locality through suitable mechanism and legal policy to community's expectation.
- Need the cooperation among State agencies at all levels and community to develop a system of unified, suitable, legal and democratic mechanism on right and interests distribution.
- Need to establish the Leading Committee at all levels and Management Board of Model including staffs who are skilled and hearted then trained to shouder the task.

- Need to have investment policy on improvement community's living standard and mobilization community to part in local and national socio-economic and cultural development programs.
- Need to legalize into community's life: eg: regulation on parent clam preservation, harvested size of clam seed, biodiversity system, harvesting control program of molluse, regulations on tax, labour management, relevant resources management,…
- Need support on initial investment of infrastructure to absorb partners' investment on local economic, cultural, social aspects, to improve the product's value, community's living standard, resources preservation and development consciousness.
- Educate and develop community's culture through programs on traditional culture, tourism, civilization life in community.
- Expand co-management scale and form as enough conditions and favorable political and historical environment.

Eg: Thanh Phong – Thanh Phu co-management model.

Part III. THE POLICY OF CO-MANAGEMENT MODEL DEVELOPMENT IN BEN TRE PROVINCE:

It origins from the fishery resources sustainable development and protection need: environment, disease, season, clam seed resource, parent clam, biodiversity system including natural nutrition for kinds of fishery, special ecosystem,…

It received the sponsor from FSPSII program of DANIDA: support to improve the management and development skill of fishery sector (SCAFI/TW).

To develop the effectiveness of co-management models of clam management and exploitation cooperatives in Ben Tre (1997 to now).

Approach to market: to control food safety and hygiene, environment protection, living environment, resources, traceability, brand name, community management and development.

I. The target of co-management model development in Ben Tre

To improve the awareness of co-management to sustainable develops the fishery sector: effectively protect the fishery resources, natural resources, environmental landscape, ecosystem, biodiversity system,…

To improve community's living standard.

To raise awareness and market approach skill of community

To raise awareness and adaptation ability to climate change.

II. Development system of Co-management model in Ben Tre

Establishment of Management Board of co-management model in province: The Board includes representatives from PPC, leaders from relevant sectors as Department of Agriculture and Rural Development, Department of Resources and Environment, provincial association of cooperatives, State bank, Department of Planning and Investment, Department of Finance, Department of Industry and Commerce, Provincial Border Command, Provincial Security and DPCs in Ben Tre.

Development of model:

1. Fishery co-management model in Thanh Phong, Thanh Phu: is the model that is assigned some rights by the State to manage and exploit and develop coastal fishery resources, forestry resources, to renew and develop the historical area Thanh Phong, Thanh Phu, Ben Tre:

+ To assign land use of coastal alluvial area.

+ To assign land use of natural clam resources

+ To assign land use of 6-nautical mile water surface

+ To assign land use of the historical area

+ To assign land use of labour use

+ To assign land use of interest distribution

According to regulations and laws, village regulations, action procedures developed by community.

2. The co-management model of biodiversity preservation area in the Ham Luong Estuary: is the model that received right distribution from the State to manage, exploit, protect and develop fishery resources and biodiversity system in the mouth of Ham Luong river.

+ To assign management right of water surface, resources, biodiversity system in the mouth of Ham Luong river to communities at 8 communes in two districts: Ba Tri, Thanh Phu basing on regulations and laws, village regulations, action procedures developed by community.

3. Synthetic co-management model in coastal area in Thoi Thuan Commune, Binh Dai District: is the model that received right distribution from the State to manage, exploit, protect and develop fishery resources and mobilize to establish association of clam cooperatives in Ben Tre:

+ To assign land use of coastal alluvial area.

+ To assign land use of natural clam resources

+ To assign land use of 6-nautical mile water surface

+ To assign exploitation of the historical area

+ To assign right of labor use

+ To assign right of interest distribution

+ To assign right of establishment of associations of cooperatives

Basing on regulations and laws, village regulations, action procedures developed by community.

4. The co-management model of snail at Vinh Binh commune, Cho Lach District: is the first model in fresh water region, the model that received right distribution from the State to manage, exploit, protect and develop fishery resources and renew and develop the historical area in Thanh Phong, Thanh Phu, Ben Tre:

+ To assign management right of snail preservation area.

+ To assign management right of the ecological tourism area Vinh Binh

+ To assign right of labour use

+ To assign right of interest distribution

Basing on regulations and laws, village regulations, action procedures developed by community.

Part IV. DEVELOPMENT SOLUTIONS

R & D of science and technology

Fishery cooperatives carry out projects, scientific and research programs with Department of Fishery, institutes and universities as:

+ Institute of Nha Trang Oceanography cooperates with Department of Fishery to do Scientific Theology of some protection solutions, clam and oyster resources development in the coastal tidal area in Ben Tre (2001).

+Research Institute of Fishery Aquaculture II cooperated with Department of Fishery to carry out research project on Ben Tre clam resources protection and development; investigation projects on Ben Tre clam aquaculture. To investigate and assess the features of biology, growing and productivity of Ben Tre clam. To analyze clam diseases … (2004).

+ Hai Phong Institute of Marine Fisheries cooperated with Department of Fishery to implement the project: “Survey on coastal Environment”. (2003)

+ Besides many individuals and scientific research organizations cooperated with provincial sectors to implement research projects on water environment features and clam primary productivity in water chasm in Ben Tre (2001, Nguyen Tac An), geochemistry, geomorphology and flow in clam areas (2001, Nguyen Van Luc); the biological features and Ben Tre clam aquaculture technique (1996, Nguyen Huu Phung)…

+ To clam preservation and aquaculture in Ben Tre really are meaningful as Institute of fishery aquaculture II currently cooperates with Department of Fishery (Department of Agriculture and Rural Development Ben Tre) to carry out the project:"To define the reason of annual clam death and to provide the solutions" (2007); Rang Dong Fishery Cooperatives coordinates with Trung Son University (China) to develop the project: "To produce man-made clam seed in Ben Tre" (2008). Southern Sub-Institute of Fishery Economics and Planning cooperated with Department of Agriculture and Rural Development Ben Tre to implement the Ministerial project: "Study on development and protection model of clam and black cockle in the river's mouth area in Tien Giang, Tra Vinh, Ben Tre (2008), Nha Trang Institute of Oceanography coordinates with Department of Agriculture and Rural Development Ben Tre to carry out the project:" To investigate and forecast the Ben Tre clam aquaculture environment"

Community education:

Through the program of FSPS II DANIDA (2006-2010), the Department of Fishery has combined community education activities on development of co-management model; training of Fishery Law, Cooperatives Law, Environment Law, Minerals and Resources Law, training on management, observation skills, as well as assessment skill on cooperatives' business; to hold plan on black cockle, oyster (2007); to organize conferences on assessment of MSC implementation at cooperatives; to guide the way of development and organization meetings to collect ideas on regulation and action plan of provincial association of fishery cooperatives; meetings on co-management model development in fishery exploitation, meetings on co-management model of biodiversity in Ham Luong River estuary preservation (2008),…

Solution on Science and Technology

- The coastal estuary area needs to be planed fully and in detail to manage and develop aquaculture, to define aquaculture location for each specific region, to develop the strategy of clam aquaculture development to invest the aquaculture science and technology, seed production, infrastructure, to develop suitable experimental models.
- Basing on the specific planning of aquaculture area to develop stably and durably, it needs to delineate the distribution places of parent clam, seed clam to propose solutions on suitable technique of seed exploiting, to protect and reproduce the parent clam resources and locate aquaculture areas of commercial clam.
- To strengthen the application of scientific results on clam seed production, clam clean technology, environment investigation, disease prevention, aquaculture technology combining with other objects.

Solution on Education:

- To train skilled staffs to manage cooperatives to develop according to the industrialization orientation and to cooperate with processing factory in product traceability, brand name protection and development, sales and profit increase of cooperatives.
- The program of MSC criteria development for clam basing on co-management organization was established at cooperatives; the problems of product preservation, biodiversity preservation, harvesting control, society have been done consciously. This model is summed up and widened at all communities that manage, exploit and aquaculture clam in Ben Tre province and other

closed provinces to ensure the sustainable development and meet the higher and higher demand of market then to organize MSC to assess and set up brand name.

Solution on management

- Currently, at clam resources development areas, management organizations have been established (cooperatives, production group, club), however some cooperatives and teams business ineffectively because they are weak in management, so it needs to be improved and widened the management model like Rang Dong Fishery Cooperatives' one.
- To finish policies on land assignment, capital support to invest, exploit and widen the areas that are suitable to clam aquaculture.
- To pilot the synthetic management model for coastal regions then cooperatives can support the career change for fisherman households who are exploiting resources in coastal regions, river's mouth by forbidden fishing gears (destructive)
- Basing on the establishment of association of provincial clam aquaculture cooperatives, cooperatives in province can support each other to develop (seed, capital, human resources,…) and in security of aquaculture area and territorial waters in the managed regions.

Solution on capital:

- To develop the association chain among export processing factory, purchase unit, logistic enterprise and association of cooperatives to improve the capacity of capital, market, science and technology with the aim of speed up development.
- Besides the strengthening of aquaculture development, the absorption of investment capital from sectors, organizations, enterprises (in and out of the province) has been changed the inhabitant's life.

Part V. Recommendation

1. In order to have the foundation of sustainable development of alluvial areas, the State needs to issue policies on non-tax land assignment and long-term use for clam cooperatives according to co-management models.

2. The State should issue the policy on capital priority so cooperatives can widen the production (exploiting, processing, exporting fishery) as well as define clearly function, right, role of management agencies that develop the economic potentials of coastal regions.

3. To strengthen the cooperation of authority agencies in protection of biodiversity system at estuary, seed clam and parent clam resources, in harvesting control of mollusk, product quality management.

4. To support investment and commerce promotion through the application of clean technology and management program of product quality to export the alive clam with the aim of value improvement of Ben Tre clam.

The above is some basic content of the mollusk development program of Ben Tre fishery sector that received the support from sectors at all levels, socio-economic and scientific organizations in Vietnam and foreign ones and the program gained some significant achievements. On behalf of Ben Tre fishery sector and fisherman community, I would like to send all of you best regards.