

## Integrated Coastal Resources Management in Sihanoukville (ICRM-SV), Cambodia

*Yos Chanthana*

Deputy Director

Marine Aquaculture Development Center

Fisheries Administration, Sihanoukville Fisheries Office, Cambodia

### Introduction

The third ICRM project was initiated in 2005 Cambodia as the ICRM-SV under the collaborative arrangement between SEAFDEC and the Fisheries Administration (FiA) of Cambodia, taking into account the geographical advantage and the prioritized need of a CBRM approach in the country. The ICRM-SV project site is located in Prey Nup II in Sihanoukville comprising four major villages (**Fig. 1**), where a core body to implement the CBRM concept has already been established prior to the implementation of the project.

Cambodia is the only country in Southeast Asia where a fishery resources co-management regime is legitimately established through the Royal Decree on Establishment of Community Fisheries and the Sub-Decree on Community Fisheries Management which were promulgated in May 2005 and June 2005, respectively. The FiA Cambodia has changed its governing structure with the creation of the new division called “Inspectorate Division”, which is responsible for fisheries development at the provincial level. In line with this restructuring, Kampong Som FiA Cantonment (KSFC) was created in place of the old Fisheries Office of Sihanoukville Municipality.

Among the major achievements of the ICRM-SV is the preparation and development by the local fishers of the Community Fisheries Area Management Plan (CFAMP). Documents related to CFAMP and specifically the Community Fisheries Zoning Map (CFZM) and the Community Fishing Area Agreement (CFAA) have already been endorsed by the local administration offices for the approval of the Governor of Sihanoukville. The approved Guidelines for the Community Fisheries govern the implementation of the community-based fisheries resources management (CBRM) concept in Sihanoukville, Cambodia under the ICRM-SV project.

### Objectives of the ICRM-SV Project

The ICRM-SV Project aims to: (1) develop the capacity of local human resources to empower them to manage and sustain coastal resources and community development; (2) encourage local peoples’ participation in community activities; and (3) alleviate poverty in coastal fisheries communities.



**Fig. 1. Map showing ICRM-SV project site**

## Activities of the ICRM-SV Project

The major activities implemented under the ICRM-SV project include:

### 1. Baseline/Monitoring Survey

#### 1.1 Fish landing data collection

The fish landing data collection has been regularly conducted everyday by designated enumerators in fish landing stations. The data collected were sent to SEAFDEC/TD for analysis and compilation. The data obtained from February 2006 through September 2007 were analyzed and compiled in December 2007, and published in June 2008. The initial findings indicated some important trends of the fishery resources dynamics in 2006 and 2007, although the data collected seemed incomplete and insufficient.

### 2. Promoting and extending locally based fishery resources management

#### 2.1 Community Fisheries Area Management Plan (CFAMP)

Following the Guideline of the Community Fisheries amended in 2007, related documents such as the Internal Law (I/L) and By-law (B/L), List of CF members, structure of the Community Fisheries Committee, Community Fisheries Area Management Plan (CFAMP), and Community Fishing Area Agreement (CFAA) were submitted to the newly reorganized office, the Kampong Som FiA Cantonment (KSFC). Although CFAMP has already been initially implemented, more time would be needed to implement it properly and until then, the impacts of CFAMP could only be assessed.

The formation of Community Fisheries Coordination Committee (CFCC) has been initially discussed. Consistent with the provisions in the Sub-Decree of Community Fisheries, the CFCC should be formed to pursue fisheries resources management matters.



#### 2.2 Local Enforcement Unit (LEU)

Patrolling by the LEU has been made a regular activity as the patrolling the project area against illegal fishing has been considered vital considering that the project has established the fish refugia for blood cockle and the increasing numbers of illegal fishing boats with dredges observed in the demarcated zone. The community has been working closely with the local authorities and the FiA Office. As a result, illegal fishing activities have been cracked down and have since then been decreased considerably. In addition, mangrove forests have also been protected from illegal occupations. The result of the patrolling activity by the LEU is shown in **Table 1**.

**Table 1. Result of Patrolling by LEU from January to June 2008**

Violations	Cases	Punishment for violators
Use of illegal fishing gear		
Blood cockle dredge	8	Confiscation of dredges and catch, and receiving lectures on law abiding
Push nets	14	Arrest
Mangrove felling	8	Write pledges not to do again
Digging ponds in mangrove forests	2	Write pledges not to do again

2.3 Establishment of the fish refugia

To follow up the recommendation made in the preliminary survey to establish fish refugia, a Fishers Workshop was held on 19 February 2008 at the project site, where the outcome of the preliminary survey was described and the objective to establish fish refugia was explained. The Blood Cockle Fishers Group (BCFG) was organized during the workshop under the Community Fisheries Prey Nup II with an initial of 25 fisher-members. Since then, more than 100 fishers have already been registered as members of the BCFG. Self-regulatory Measures (**Table 2**) have been developed by the BCFG in April 2008, which would be subsequently incorporated into the Community Fisheries Area Management Plan (CFAMP). The essence of the controlling measures is the harvestable size limitation and protection of fertile (gravid) shells during spawning season within the demarcated zone as fish refugia.

**Table 2. Self-regulatory measures to control harvest of blood cockle**

<b>Area of coverage:</b> 200 ha
<b>Limitations</b> Fishing season: all year round Fishing hours: no limit
<b>Restrictions</b> Harvestable size: <ul style="list-style-type: none"> <li>• More than 100 pcs/kg or over 10 g/pc allowed all year round</li> <li>• Less than 50 pcs/kg allowed during the spawning month (one month)</li> </ul>
<b>Fishing entry</b> In addition to the members of the BCFG, outsiders are also allowed to collect blood cockles in the demarcated self-regulated resources management zone, provided they should be bound to abide by the regulatory measures



**Biological survey for the blood cockle refugia**



Preparations for establishment of blood cockle refugia

The establishment of “fish refugia” in the project site was partly consorted with the regional movement led by the regional project on Establishing a Regional System of Fisheries Refugia, being deployed under the regional project of the UNEP/GEF. As envisaged, this project would establish several fish refugias in the coastal zones from Cambodia to Vietnam.

#### 2.4 Crab bank

Three crab bank approaches were proposed in the project site, i.e. the Japanese model, Chumphon model and Langkawi model. Finally, the fishers decided to employ the Chumphon model, which involves the stocking of gravid crab in a cage during the calm seasons until the eggs are hatched. While during the monsoon seasons, gravid crabs would be released directly into the water after marking their carapaces as in the Japanese model. In May 2008, the Crab Bank Group was established with 11 crab fishermen as members while 5 gravid crabs were stocked in the project’s crab bank. **Fig. 2** shows the progress of the crab bank activity of the project.

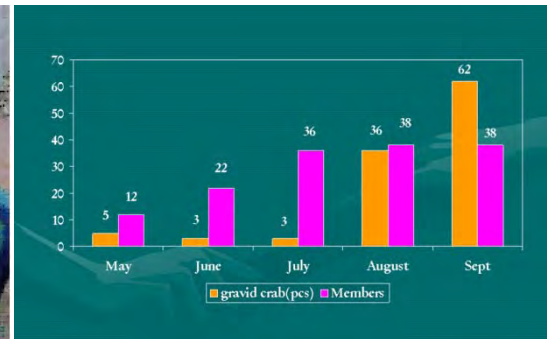


Fig. 2. Crab bank activity of the ICRM-SV project

### 3. Promotion of local business

Immediately after the start of the ICRM-SV project, the women’s groups were organized under the framework of the Community Fisheries Nup Prey II. One of the most lucrative ventures the women’s groups went into id mushroom production.

#### 3.1 Women’s Groups Activity

##### 3.1.1 Mushroom production

The fishers (mostly women) organized themselves into “Mushroom Producers Group under Community Fisheries Prey Nup II (MPG)” and established their own Internal Rules of Mushroom Producers Group.

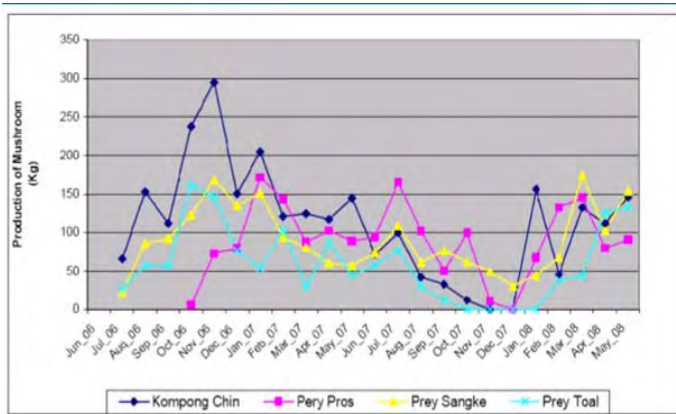


**Mushroom production training under the ICRM-SV project**



**Members of the Women’s Group involved in mushroom production**

In the review of mushroom production in 2007, it was observed that the production level in 2007 was comparatively sluggish and as shown in **Fig. 3**. Although production had dwindled towards the end of 2007, the MPG continued producing mushrooms especially that production showed an increasing trend again in 2008.



**Fig.3. Mushroom production under the ICRM-SV project**

Based on the account summaries, the groups have practiced maintaining their bookkeeping and accounting functions to a greater extent and accuracy in the recording has been noticeably improved. For the maximum utilization of the funds derived from the savings from mushroom production, the women’s groups commenced diversifying to other local business ventures such as rice trading and animal raising. In addition, a mini-credit scheme was also initiated using as capital funds from their savings and incomes generated from bank interests.

3.2 Mud Crab Culture Group Activity

### 3.2.1 Mud crab fattening

Based on lessons and knowledge learned and experiences gained through the experimental mud-crab culture in early 2007, the second trial began in November 2007 using 847 pcs of juvenile mud crabs confiscated by the Kampong Som FiA Cantonment (KSFC) and brought to the project site. Later, 574 pcs female and 698 pcs male crabs were purchased from the local suppliers and stocked in pond No. 2 and 3, respectively. Further, 450 pcs female and 619 pcs male crabs were procured in December 2008 and stocked in Pond No. 4 and 5, respectively. Since then, the crab fattening exercise had been practiced together with monitoring and measurement of the salinity and water temperature which were recorded daily in the logbook.

Growth in sizes and weights, and DO were also periodically monitored in collaboration with a JICA Expert. The amount of daily feeds given was controlled by observing the remaining feeds on the feeding trays. The weight growth monitoring result showed a satisfactory progress as seen in **Fig. 4**.



Mud crab activity under the ICRM-SV project

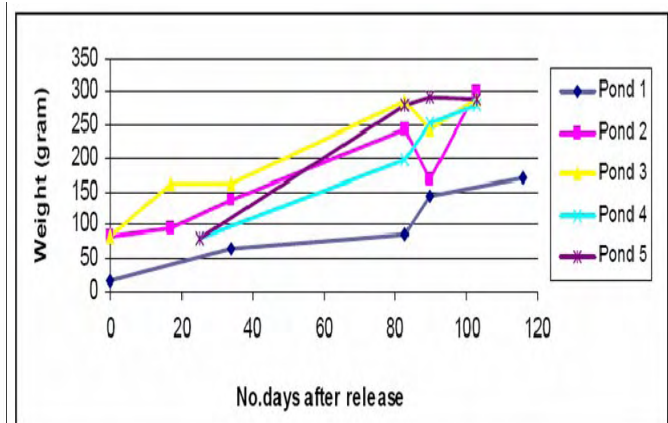
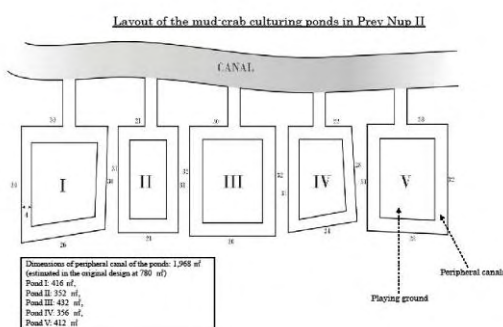


Fig. 4. Mud crab activity under the ICRM-SV project

Most crabs reached marketable size (200 g/pc) toward the end of February 2008 and were harvested from 28 February 2008 until 14 March 2008. However, the result indicated a low average survival rate of only 2.4% and the gross income was only 6,609,300 Riel equivalent to USD 1,652.

Since the members were eager to continue the activity, a JICA expert was asked to provide technical assistance and also committed additional JICA support to the scheme for the continuous monitoring system of DO, salinity and water temperature. After the members realized the real cause of low returns, they committed to exert their full efforts in the future operations.

### 3.2.2 Fish cage culture

Since the members of the fishermen’s group in Kampong Chin are far from the mud crab culture ponds, therefore fish cage culture of grouper or sea bass was tried for them as an alternative livelihood. A suitable space in the Prey Nup Estuary was earmarked for this activity, which is located near the mouth of canal with minimum depth of 150 cm.

The Fish Cage Culturing Group (FCCG) was then organized as a sub-group of the CF Prey NupII in April 2008 with six (6) members to promote a cage culture venture. Sea bass (*Lates calcarifer*) was selected due to a number of advantages. Stocking of sea bass fingerlings started on 23 September 2008.

## 4. Enhancing the human resources capacity and participation

Throughout the project operation, main emphasis was given to human as well as institutional capacity building especially for the Community Fisheries Prey Nup II, and further for the sub-groups such as the Mud-crab Culture Group, Blood Cockle Fishers Group, Mushroom Producers Group, Crab Bank Group, and Fish Cage Culture Group. A series of workshops and study tours were conducted during which relevant handouts in Khmer were distributed as discussion and extension materials. Also, more chances were given to the members to participate actively in the discussions and presentations in the workshops so that they would be convinced to take part in the activities.

### 4.1 Study tours

Study tours were also conducted through the ICRM-SV project. These included: (1) study tour to Chumphon, Thailand to inspect the progress of the ICRM-PD activities more particularly the crab bank activity; (2) study tour to Stung Hao to inspect the Crab Bank activity with the participation of 16 members of the Crab Bank Group and the national project staff on 5<sup>th</sup> April 2008; and (3) study tour to Kompot Province to inspect mud-crab culture with the participation of 2 members of the Mud-crab Culture Group, the national project staff and the FiA staff on 8<sup>th</sup> April 2008 (Fig. 5).



Fig. 5. Study tour (above) and fishermen’s workshop (below)

## 4.2 Workshops

In addition fishermen workshops were also conducted on various topics (Fig. 5 and Table 3)

**Table 3. Fishers workshops held from January to June 2008**

Date	Title	Topic	Participants
18.02.08	Women's Group	Establishment of Mushroom Producers Group	22
18.02.08	Crab Bank Workshop	Application of Crab Bank scheme in the area	26
19.02.08	8 <sup>th</sup> Fishers Workshop	Application of fish refugia scheme in the area	35
19.02.08	Cage Culture Group	Preliminary discussion on cage culture	8
01.04.08	9 <sup>th</sup> Fishers Workshop	Monitoring mud-crab culture outcome	22
01.04.08	2 <sup>nd</sup> Crab Bank W/S	Establishment of Crab Bank Group and action plan	25
02.04.08	2 <sup>nd</sup> Fish Refugia W/S	Establishment of Blood Cockle Fishers Group	39
03.04.08	2 <sup>nd</sup> Cage Culture W/S	Establishment of Cage Culture Group	11
18.06.08	10 <sup>th</sup> Fishers Workshop	Action plan on 3 <sup>rd</sup> experiment of mud-crab fattening	27
18.06.08	3 <sup>rd</sup> Cage Culture W/S	Practical and economic feasibility on sea-bass culture	13
19.06.08	3 <sup>rd</sup> Crab Bank W/S	Debriefing on the outcome of study tour / monitoring gravid crab stocking	31
19.06.08	3 <sup>rd</sup> Fish Refugia W/S	Formulation of Self-regulatory Regulation for blood cockle fishing	22

## 4.3 Training

More emphasis has been placed on site training especially in the improvement of bookkeeping and accounting technologies for the women's groups, Crab Bank Group and Mud-Crab Culturing Group. Through such efforts, the preciseness of the records entered in the accounting books has noticeably been reckoned and has been considerably improved.

## 5. Rehabilitation and enhancement of the coastal resources

### 5.1 Establishment of the fish refugia

As envisaged, fish conservation area called fish refugia has been established, where initially the fish refugia targeting blood cockle fishing was established in the project area, and the self-regulatory measures have been formulated by the participating fishers themselves. The fish refugia established in the project area was the first one which is practically functional in Cambodia and is expected to be disseminated to other areas following this model depending on its outcome in future.

### 5.2 Mangrove reforestation

The first mangrove plantation day was on 5 December 2007 which included an educational session for school children who are responsible for environmental protection in the future. On that day, about 200 school children and 50 fishermen participated in the event and 1000 mangrove seedlings were planted in Khos Angkor. The condition of the mangroves has been monitored occasionally, and it was observed that over 50% of mangroves planted had survived.

