



**WOMEN'S GROUP ACTIVITY
IN
PRODUCTION OF MUSHROOM**



**Community Fisheries Prey Nup II
Sihanoukville, Cambodia**



Prepared
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30 June 2007

**Integrated Coastal Resources Management in
Sihanoukville
(ICRM-SV)**

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REPORT ON
WOMEN'S GROUP ACTIVITY – PRODUCTION OF MUSHROOM
Community Fisheries Prey Nup II
under ICRM – SV

Seiichi Etoh
SEAFDEC/TD
30 June 2007

1. Background

One of the project objectives under ICRM-SV is “alleviation of poverty in the fishing community” and in order to pursue such objective, a local business venture was developed and deployed by the project. This approach was particularly intended to improve the livelihood in fishing communities by increasing incomes and providing new job opportunities for those who are not engaged full time in fisheries. At the same time, it was also intended to assess the supplemental effects of the realization of community-based fishery resources management by encouraging group-working spirit among the stakeholders. In addition, this approach is envisioned to help in the long run the fishing communities that are under pressure due to over-exploitation of the coastal fishery resources and/or over-capitalization of fishing efforts. Thus, the approach was ultimately aimed at improving such adverse situations to the optimum level.

Substantial efforts were therefore exerted from the outset of the project operation towards the materialization of such approach. The approach was first initiated as part of the women's group activities among others as it was considered most vital and the women were easily accessible. This approach also conformed to the outcome of the baseline socio-economic survey which indicated the imminent need of providing job opportunities to the women's groups in the fishing communities.

2. Identification of local business venture

Based on the result of the baseline socio-economic survey conducted prior to the commencement of the project, many housewives were asking for any group work activities that could provide them some form of additional incomes in order to make the maximum utilization of their free time. Responding to their request, the first Fishers' Workshop cum first Women's Workshop was organized on 14 December 2005. In this workshop, orientation on local business venture development was made to the fishing community and the ensuing discussion centered on how to identify appropriate approaches for local business ventures that are not necessarily fisheries-related. At this meeting, experiences gained from the sister projects, i.e. ICRM-PD in Thailand and ICRM-PL in Malaysia, were presented as applicable models for consideration. A final decision was not reached at the workshop but after the formal organization of the women's groups they agreed to continue internal discussions among themselves and bring forward a concrete proposal at the second meeting.

Thus, during the 2nd Women's Group Meeting held on 9th February 2006 with 25 participants including the committee members of Prey Nup II Community Fisheries and the heads of villages, discussion was held to identify potential local business ventures to be carried out by the women's groups. During the lively deliberation, the following local business ventures were proposed after considering various factors and conditions such as raw materials availability, easy accessible technology, modest investment and readily available marketing channels of products.

- a. Mushroom production
- b. Fish sauce production
- c. Fish culture
- d. Poultry raising

It was eventually agreed at the beginning to focus on mushroom and fish sauce production. In fish aquaculture for example, there is a need to study the various culture aspects like species selection, seeds supply, marketing, etc. prior to setting up the work and therefore a feasibility study will be needed which was to be arranged later. As for poultry raising there was some reluctance in trying out this venture because of the incidence of bird flu prevailing in neighboring countries thus, the proposal was set aside for the time being. For fish sauce production, further investigation was made which indicated that there is certain difficulty in obtaining steady supply of raw materials at reasonable prices. It was therefore eventually decided from among the other local potential business ventures considered to focus instead on mushroom production.

3. Organization of the Women's Groups

Parallel with the effort to identify appropriate local business venture during the first Fishers Workshop, an attempt was also made to organize the Women's Groups, an idea that came up after learning the successful approaches experienced in the sister projects. It was therefore suggested that one women's group should be formed in one village. Thus, four groups were formed in the project area in Prek Nop II, comprising Kampong Chin, Prey Sangke, Prey Pros and Prey Toal. The structure of the group was discussed and election of the chairperson, vice-chairperson, a secretary and cashier was made.

4. Training in mushroom production

Following the above decision, effort was exerted by the project to identify an appropriate institution which could train the women's groups in mushroom production. The Prey Konkhla Vocational Training Center (PKVTC) in Battambang Province was considered to conduct the required training course. After negotiations, a 5-day training course was initiated on 2nd May 2006 in the premises of the PKVTC that continued until 6th May. The training which included both practical and commercial application of the new technology was very fruitful because of the capabilities of the instructors who were knowledgeable on the subject matter. The training course concentrated mainly on the production of the oyster mushroom and to a lesser extent the straw mushroom. The detailed description on this training is shown in Annex 1: Report on the training course in mushroom production.

5. Economic feasibility study of mushroom production

Prior to and during the above training course, the economic viability of mushroom production was analyzed based on the data and information collected from Battambang Province and Shianoukville. The analytical result showed positive profit (Table 1) although actual production used a simpler method.

6. Construction and procurement of necessary facilities and equipment

Having been convinced of the economic viability after the completion of the training course, setting-up of cottage-scale mushroom production yards in each village was initiated on 7th June until 20th June 2006. This included the construction of necessary premises comprising:

- a steam chamber with 2 sets of steam vat for sterilizing spore bags (utilizing used 200l oil drums),
- a cultivation house for storing spore cultivation bags (a simple local hut covered with wood bark and nipa leaves, wooden shelves for laying cultivation bags and occupying an area of 15 m²)
- a working space for mixing ingredients like rice bran, lime and saw dust (a plastic ground sheet the dimension of which is 3 x 3 m) and packing,
- A storage room for ingredients and packing materials (any space could be utilized provided it is protected from rain and wind).

The equipment and materials used in the construction of the above facilities are listed in Annex 2: Cost calculation for mushroom production.

Table 1: Profit and loss calculation in mushroom production

A. Basis of calculation			
- Production capacity	5,000 packs		
- Production period	8 months		
- Members of a group	10 persons		
- Productivity	1 kg/pack/8months		
		Cost	
		('000 Riel)	(USD)
B. Fixed cost		699	175
C. Total variable cost (757,000 Riel x 2.5)		1,893	473
D. Total initial investment cost		2,592	648
E. Profit and loss calculation			
1. Gross sales of production (5,000kg x 2,700 Riel/Kg)		13,500	3,375
2. Marketing overhead (15%)		2,025	506
3. Net sales of production		11,475	2,869
4. Incurred expenses			
- Depreciation of fixed structures (Depreciation for 3 years)		233	58
- Variable cost		1,893	473
Sub-total:		2,126	532
5. Gross income		9,349	2,337
6. Savings for investment or revolving fund (20%)		1,870	467
7. Net income before share		7,479	1,870
8. Share for each member/8 months (10 members in all)		748	187
9. Monthly share (for 8 months)		93	23

All the necessary equipment and materials like saw dust, rice bran, lime, mushroom spores, etc. for producing the mushrooms that were procured are also listed in Annex 2. The total initial investment cost including the initial revolving fund is estimated at Riel 5,398,000 (USD 1,350) for the 4 village groups, itemized in the table of Annex 2.

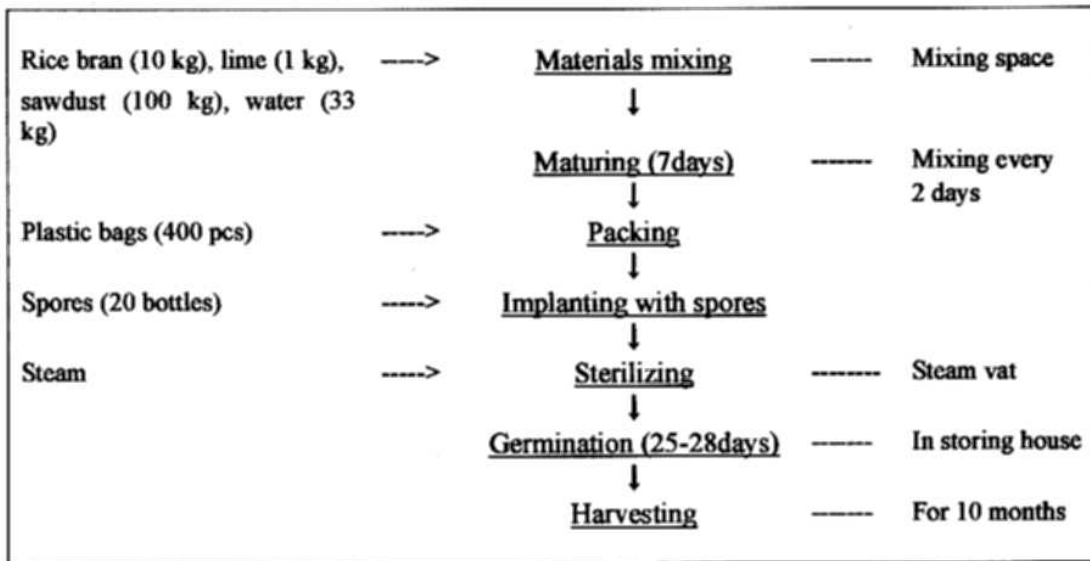
7. Commencement of production

After the construction of the cottage-scale mushroom production yard in each village, actual production began towards the end of June 2006 following the sequence of procedures shown in Fig. 1. At the start of the production, the Director of PKVTC was invited to serve as consultant for 5 days from 21 to 25 June 2006 to guide the women's groups in the installation of the facilities and production arrangement.

8. Production and marketing of mushroom

After the preparation of the cultivation bags in each village towards the end of June, first production was simultaneously achieved by the four groups in the middle of July 2006.

Fig 1: Sequence of mushroom production

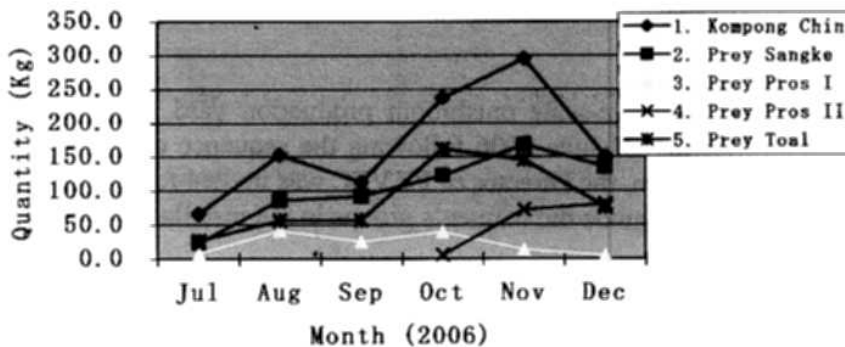


The four groups initiated their production using the same facilities and capacity but the production levels differed as shown in Table 2. All groups were progressing well except the group in Prey Pros. The location of the processing yard in Prey Pros was found inappropriate as it was damaged during high tide and was infested with rats. Some facilities and equipment were therefore moved to a better site in September 2006 although the storing house and shelves were newly constructed and production has since then been continued by another women's group, the Prey Pros II while the first group as Prey Pros I stopped producing the spore bags in September 2006. In fact, there had been some discord among the members in Prey Pros I since the inception which led to the setting-up of the second group.

Table 2: Production record of mushroom in 2006 by each group

Women's Group	Production in Month (Kg)						Total (Kg)
	Jul	Aug	Sep	Oct	Nov	Dec	
1. Kompong Chin	66.0	153.0	112.3	237.5	295.5	150.5	1,014.8
2. Prey Sangke	23.0	85.7	92.1	122.9	168.4	135.3	627.4
3. Prey Pros I	8.0	42.6	26.0	40.4	14.3	5.1	136.4
4. Prey Pros II	0.0	0.0	0.0	6.5	72.5	80.0	159.0
5. Prey Toal	26.7	56.5	56.7	161.5	146.5	76.0	523.9
Total:	123.7	337.8	287.1	568.8	697.2	446.9	2,461.5

Mushroom production record by group in 2006



At the initial stage, their products were separately marketed either in the Veal Renh or in adjacent villages. However, the group in Kompong Chin had a geographical advantage because the village is closest to Veal Renh and the products from the other groups were also sold at the same market channel in Kampong Chin. The sales of each group are shown in Table 3 while the average selling prices varied from Riel 2,400 to 3,180 as shown in Table 4.

Table 3: Sales record of mushroom by each group in 2006 (in Riel '000)

Women's Group	Sales amount in Month ('000 Riel)						Total ('000 Riel)
	Jul	Aug	Sep	Oct	Nov	Dec	
1. Kompong Chin	191	392	295	683	791	398	2,750
2. Prey Sangke	67	221	260	311	445	342	1,646
3. Prey Pros I	32	189	80	88	38	14	441
4. Prey Pros II	0	0	0	15	181	199	395
5. Prey Toal	49	138	144	432	455	191	1,409
Total:	339	940	779	1,529	1,910	1,144	6,641

Monthly Sales Record in 2006

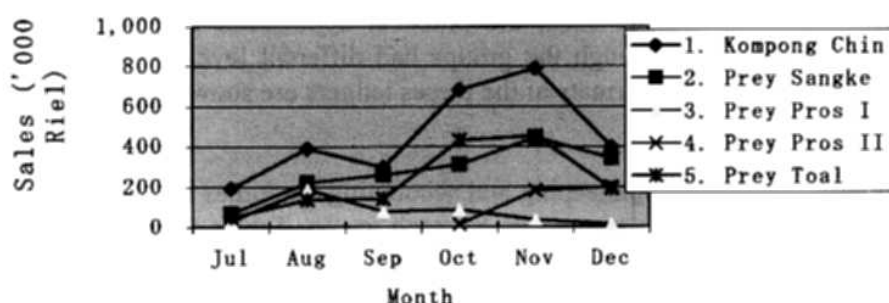
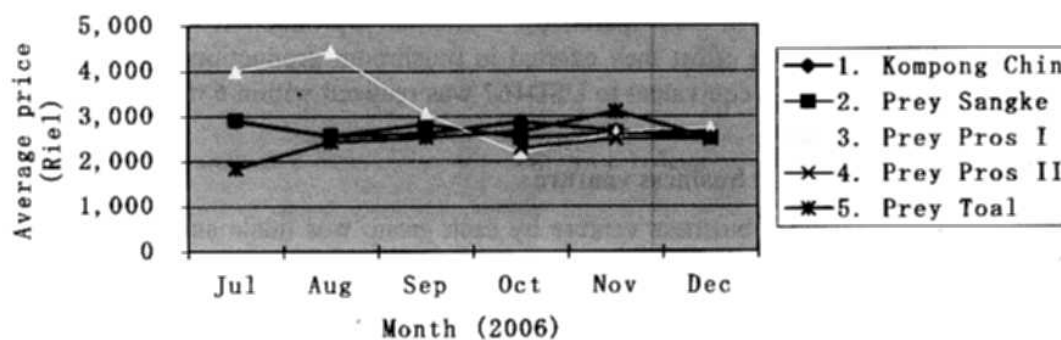


Table 4: Average selling price per kg of mushrooms by each group in 2006 (in Riel '000)

Women's Group	Average selling price per Kg (Riel)						Mean (Riel)
	Jul	Aug	Sep	Oct	Nov	Dec	
1. Kompong Chin	2,894	2,562	2,627	2,876	2,677	2,645	2,713
2. Prey Sangke	2,913	2,579	2,823	2,531	2,643	2,528	2,669
3. Prey Pros I	4,000	4,437	3,077	2,178	2,657	2,745	3,182
4. Prey Pros II	0	0	0	2,308	2,497	2,488	2,431
5. Prey Toal	1,835	2,442	2,540	2,675	3,106	2,513	2,519
Total:	2,911	3,005	2,767	2,513	2,716	2,584	2,749

Average selling price per Kg



9. Bookkeeping and accounting

A major foreseeable problem in any local group business venture usually lies in lack of transparency in accounting, a problem also common in most women's group activities everywhere. Aimed at overcoming this predictable constraint, an effort was made by the project to introduce a simple bookkeeping and accounting system from the start of the mushroom production. First, a training session was held introducing simple bookkeeping and accounting system and thereafter, monthly monitoring practices were conducted. Held on 17 August 2006, the training had 20 leading members from four women's groups as participants where very simple bookkeeping management system was introduced and practiced, such as maintaining five ledger books, i.e. a general ledger book, an equipment ledger, a material ledger, a product ledger and a labour ledger. An exercise for entering data into these books was made during the training course but since the system was entirely new to them and the time given them was rather too short, it was difficult for most of the groups' members to immediately master the system.

Therefore, an effort was made by the project to monitor the practicability and appropriateness of entering all transactions into the corresponding ledgers. Follow-up activities were made at the local level through regular visits to each village by the extension workers and also by the SEAFDEC/TD team intermittently. As such, the practical application of the new accounting system could put in proper place although the groups had different levels of apprehension and subsequent practical application. The formats of the theses ledgers are shown in Annex 3.

10. Sales and income

With the introduction of the simple bookkeeping and accounting system as indicated above, proper recording of the production and sales was made by each group. Tables 2 and 3 show the total mushroom production for 6 months from July to December 2006, which was 2461.5 kg and the total gross sales of 9,344,000 Riel equivalent to USD 2336 while Table 5 shows the gross income of each group after deducting the expenses incurred during production of the mushrooms for 6 months. The detailed calculation of the gross income is shown in Annex 4: Profit and loss calculation in mushroom production in 2006.

Table 5: Sales and income of mushroom production by group

Item	Group (in Riel)					Total	
	Kampong Chin	Prey Sangke	Prey Pros I	Prey Pros II	Prey Toal	(in Riel)	(in USD)
Sales	2,750,000	1,646,000	440,000	395,400	1,409,900	6,641,300	1,660
Incurred expenses	1,388,667	1,639,567	1,118,500	324,917	1,500,500	5,972,151	1,493
Gross income	1,361,333	6,433	-678,500	70,483	-90,600	669,149	167

As shown in Table 5, the Kampong Chin group had the highest gross income followed by those in Prey Pros II and Prey Sangke while the groups in Prey Pros I which was closed in October 2006 and Prey Toal showed deficit in their operations. Particularly, production by the Kampong Chin was extremely higher and the effort they exerted in mushroom production was very evident. A gross income of Riel 669,149 equivalent to USD167 was realized within 6 months of operation in 2006.

11. Economic viability of the business venture

An economic analysis of the business venture by each group was made and shown in Annex 4. The methodology used is described in Annex 4-7: Explanation of Analysis.

As seen in the result, the groups in Kampong Chin and Prey Sangke could afford to reserve 20% of their gross incomes, i.e., Riel 272,267 and 1,287, respectively as fund savings. The calculated economic returns against the initial investment cost for the group of Kampong Chin reached as high as 166.0% followed by Prey Pros II and Prey Sangke at 17.8% and 1.0%, respectively. In the case of Prey Pros II, some equipment originally invested for Prey Pros I was not taken into account during the analysis.

From their gross income, the groups were required to reserve some operational funds for 2007, e.g. for repairs and maintenance of facilities and equipment, and revolving fund to purchase necessary production materials for at least two months. After deducting such funds, only the group of Kampong Chin showed a sound profit from the business venture. For the other groups, some remedial measures were recommended like saving reservations, accommodation of SEAFDEC funds, etc. These measures are described in the profit and loss calculation sheet in Annex 4.

12. Savings account

After completing the verification of all account transactions in each group, a workshop was conducted on 27 February 2007 to review the mushroom production in 2006. At this workshop, all production data and business transaction figures from the mushroom production in 2006 were presented to all members of the women's groups and the factual analysis of the results was also demonstrated. Taking into account all the figures, the women's groups were convinced to continue mushroom production in 2007. It was also agreed that separate accounts, "Savings Account" should be opened for the groups in Kampong Chin and Prey Sangke. Funds kept in the major account as depreciation reserve, 20% savings from 2006 operation, SEAFDEC reserve funds (kick-off funds upon initiation of business) that are not required for immediate operation should be transferred to such "Savings Account" after the necessary expenses for production in 2007 like purchasing processing materials and equipment as well as the earmarked cost for repair and maintenance of facilities and equipment have been deducted. Thus, Riel 1,465, 934 and 139,660 were retroactively transferred in January 2007 for the groups of Kampong Chin and Prey Sangke, respectively. This funds have since then been utilized by the group in Kampong Chin for other more lucrative business ventures like purchasing and selling rice, pig raising and mini-credit, etc.

13. Discussions

Approach

At the second women's group workshop in February 2006, few possibilities for cottage-scale ventures were identified for the women's groups to initiate in the project operational area. These included fish sauce production, fish aquaculture, poultry and mushroom production. After a study and deliberation on such opportunities with the group members, it was decided to initiate the mushroom production venture. A simple feasibility study was simultaneously conducted, the conclusion of which indicated a positive outcome. Based on the convincing result of study, actual production was initiated in June 2006. Prior to that, a training course for the potential women's groups was carried out at the Prey Konkhla Vocational Training Center (PKVTC) for one week in May 2006. At the start of the production, kick-off fund was provided by SEAFDEC/TD for each women's group. This was considered a vital approach in promoting any cottage-scale business development in the communities where basic technology in business ventures and initial funds are lacking. It was therefore noted that combined sequential approach with technical training and subsequent financial support is vital in order to realize any local business venture. Also, a speedy action in a series of activities from identification of potential business venture to the actual realization of the selected business is necessary in order to keep such an impetus going. In fact, it took only 5 months for the project to carry out the activities from the decision of the local business venture until the setting up of the actual work as in the case of mushroom production.

Practicability

The mushroom production has been continued for almost one year now giving the groups some profits to some extent. The women's groups have successfully applied the production technique after being trained and with technical follow-up from the PKVTC especially during the initial stage of production. Now the women's groups are capable of managing their own business independently. Although at the initial stage supplying the necessary raw materials was arranged by the project now this has turned into a self-procurement system jointly arranged by all groups.

The project also stopped its financial inputs in early 2007 after having been convinced that the groups could already maintain by themselves some revolving funds necessary for the production. The marketing channels have also been developed among themselves and the wholesale prices have so far been stable as shown in the Table 4.

Bookkeeping and accounting

Unlike in private business, transparency in money transactions is crucial in sustaining any local group's business ventures. With such understanding, an effort was exerted by the project to introduce a simple and user-friendly bookkeeping and accounting system from the outset of the business development. In order to properly implement such system, training course was initially conducted for the groups. In addition, follow-up monitoring on accounting has been continued regularly by the project and such efforts resulted in putting into its proper place the accounting system by each group although close monitoring has to be inevitably continued. Conducting various verifications in the business venture was made possible because of the reliable figures on production and money transactions made available by each group. This led to the precise judgment on the economic feasibility of the business venture and the derivation of indicative future strategy for business orientation and development.

Economic feasibility

Based on the results of the profit and loss calculation as shown in the figures in Annex 4, mushroom production is economically feasible, the outputs of which depend on the respective efforts of the groups. The economic returns varied from 166.0% to -9.2% for the groups in Kampong Chin and in Prey Toal, respectively (the figure for Prey Nup I was disregarded as production was suspended in September 2006). Among the four groups, the performance of the group in Kampong Chin was extremely good. The author has observed some factors that led to the excellent achievements, such as (1) strong and competent leadership of the group, (2) active and harmonized participation by all members of the group, (3) sense of good business and food manufacturing among the members, and (4) marketing advantage in terms of easy access to the main market at Veal Rean.

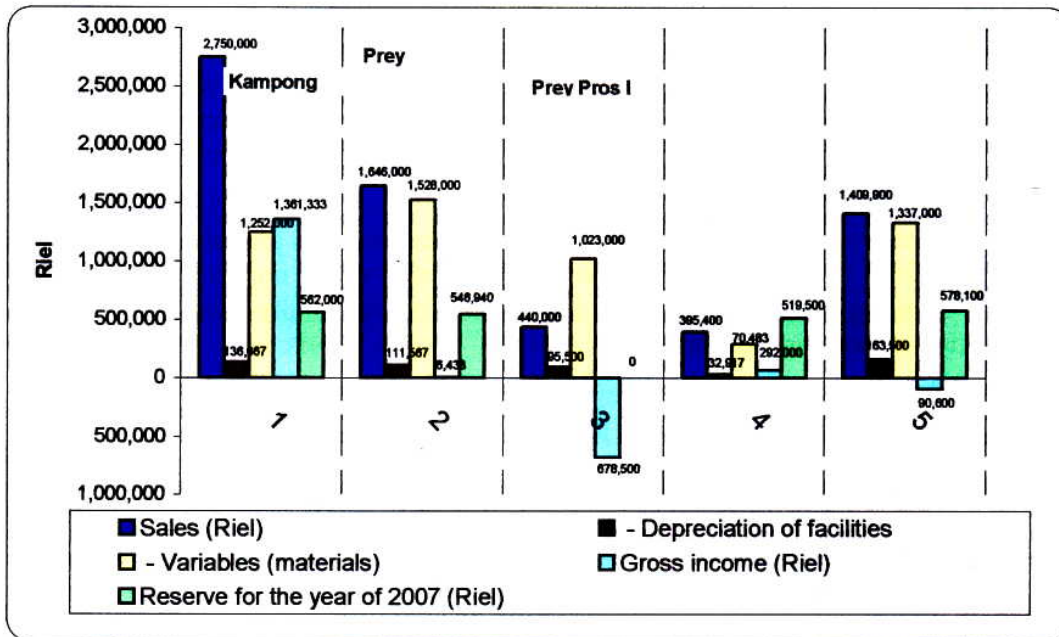
The profit made by the group in Kampong Chin was high compared with the other groups (Fig. 2) enjoying almost 50% sales profit against the incurred variable and fixed cost, while in the case of Prey Sangke only a marginal sales profit was attained in spite of spending more on variable costs. Based on this comparison, mushroom production business venture is still lucrative in the project operational area however, their achievement depends largely on the motivation and industriousness of the participating groups as all groups began producing mushrooms under the same terms and conditions. This factual outcome, which was presented at the women's workshop in February 2007 by showing all the supporting data, encouraged the groups to continue engaging in such profitable business venture.

Contribution to improve income of households

The experimental production for only six months resulted in certain varying financial impacts for the households depending on the group, but appears promising in terms of supplemental income for the participating households assuming that production level could be maintained as in the group in Kampong Chin. In fact, this group was able to provide Riel 217,813 (USD 54.50) for each member's net income as this group comprises 5 active working members only. This is equivalent to Riel 36,302 (USD 9.10) per member/month, accounting for 31.8% of an average household income (USD 28.60 per month)¹ thus, contributing to the household income as supplemental revenue, although lower than the initially expected USD 23.0 shown in Table 1.

¹ Data: Socio-economic Survey in ICRM-SV by SEAFDEC/TD, March 2005

Fig 2: Profitability of mushroom production by group



Social impact

One of the objectives in pursuing any group activity is, by all means, to provide supplemental income to the households while another objective is to build-up group working spirit in the community. Achievements on these objectives were highlighted during the local seminar on the Project Progress and Local Participation conducted in Sihanoukville in November 2006 by representatives from various local administration offices. In addition, the groups' working spirit certainly influenced the success of the community-based fishery resources management (CBFRM) approach in a sense that the CBFRM concept is basically achieved through group work and voluntary contribution in terms of time and efforts by the stakeholders.

Savings account

As described in item 12 (Savings account), an extra income from 2006 production was transferred to a newly created account in order that such available fund could be put to maximum utilization for other more lucrative business ventures and make the women's groups members grasp clearly the mode of financial transactions of the business with such account. Certain ambitious motivations of groups' members by utilizing surplus funds for other speculative business like buying and selling rice during course of the production operations were observed. They attempted to use the remaining fund without considering the need to reserve for future operations, which could affect the sound operation of the mushroom production.

The new account was therefore opened using the fund which was considered surplus after earmarking necessary amount of money for production in 2007. The implication of opening the new account and the demarcation between the general account and the savings account was explained at the women's workshop in February 2007. Only the two groups yielding surplus amount from their mushroom production in 2006 opened their new savings accounts, and are now investing funds from these accounts in other business ventures.

14. Conclusions and recommendations

- As a whole, production of mushroom in the project operational area has been achieved with promising results
- Supplemental incomes were attained by participating households to some extent through the attempts of the women's groups in producing mushroom and the scale could be further expanded, provided that efforts through a harmonized working spirit would be continuously exerted
- In general, the working morale among members of the women's groups has been very high in a harmonized way and this has given very favorable social impacts to the community certainly bringing positive effect to the embodiment of community-based fishery resources management concept in the future
- As shown in the pilot operation, strong leadership and harmonized working relationship in a group are among the crucial factors leading to the success of the operation
- Based on the financial calculations, all groups are now financially capable to manage their operation by themselves without relying on financial inputs from SEAFDEC/TD (as of 30 April 2007) as they have become financially independent through their own revolving funds as savings from past turnover
- Follow-up monitoring on bookkeeping and accounting should still be continued by the project
- For the time being the project should continue providing coordination effort especially in group purchasing of necessary production materials and equipment
- The project should continue providing guidance in the financial orientation of the business venture
- The project may consider challenging other business ventures towards the end of 2007 using the funds saved from previous production operations
- The expansion of mushroom production to other new groups would not be feasible at this stage as the current marketing channels at hand are fairly limited
- Exploitation of the marketing channels in Sihanoukville and/or Phnom Penh should be considered in conjunction with the planned expansion of the production volume in the future

References

- Yos Chanthana, Report on Mushroom Training Course, April 2006
- Etoh Seiichi et-al, Preliminary Socio-economic Study in Commune Teuk Thla, Sihanoukville, Cambodia, September 2005

Annex 1

Report on

Mushroom Training Course

Integrated Coastal Resources Management in Sihanouk ville (ICRM-SV)
From 02 - 06 April 2006

Yos Chanthana
Project Team Leader
21 May 2006

1. Background

The project action plan in 2006 was thoroughly discussed in the 2nd Steering Committee meeting on 7th February 2006 and eventually it was endorsed by the meeting after incorporating some amendment. Based on the above work plan for 2006, various activities have been deployed since then. Based on the results from the 2nd Fishers' Workshop held on 8-9 February 2006, the fishermen proposed to organize three types of small business activities such as fish sauce, fish culture and mushroom cultivation. Mushroom cultivation is considered as the first priority of the project for starting business. In order to run this business successfully the project chose 4 women from each village to attend a training course on mushroom cultivation method at the Provincial Training Center, Prey Konkla, Battambang Province.

2. Objectives

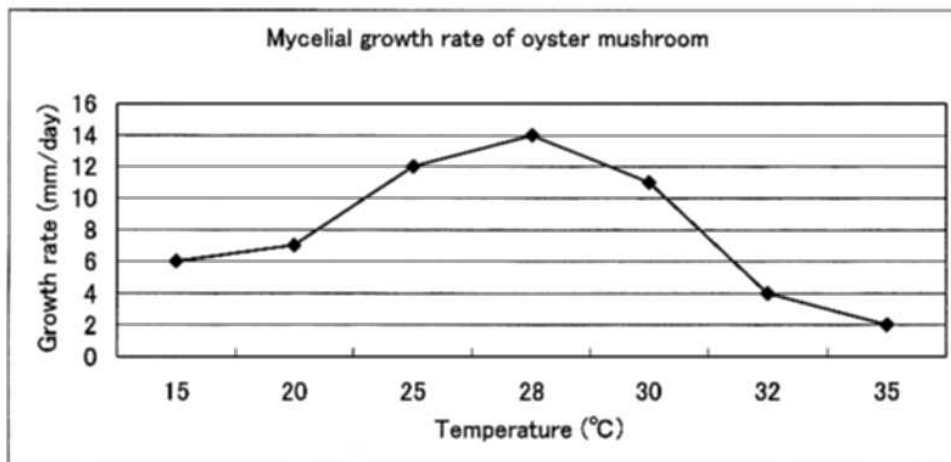
The objectives of the training course:

- to study cultivation method of straw and oyster mushroom
- to discuss the mushroom market
- to discuss how to start mushroom business
- to visit mushroom cultivation activities at some villages

3. Participants

Cambodia

- | | |
|----------------------|-------------------------|
| 1. Mr. Yos Chanthana | Project team leader |
| 2. Mr. Phan Sokhon | Agricultural staff |
| 3. Mrs. Li Nhip | Woman from Prek Sanke |
| 4. Mrs. El Mayam | Woman from Prek Sanke |
| 5. Mss. Uk Sam Ath | Woman from Prek Sanke |
| 6. Mrs. Ly Ai Sak | Woman from Prek Sanke |
| 7. Mrs. Sen Fas | Woman from Prek Toal |
| 8. Mrs. Tun Pov | Woman from Prek Toal |
| 9. Mrs. San Nanh | Woman from Prek Toal |
| 10. Mrs. Sos La | Woman from Prek Toal |
| 11. Hok Tean | Woman from Kampong Chin |
| 12. Kong Non | Woman from Kampong Chin |
| 13. Prum Neab | Woman from Kampong Chin |
| 14. Heng Sokun | Woman from Kampong Chin |
| 15. Chea Thoeun | Woman from Prek Pros |
| 16. Im Nean | Woman from Prek Pros |
| 17. Chea Sain | Woman from Prek Pros |
| 18. Noun Khon | Woman from Prek Pros |



3) How to mix materials?

To make mushroom solution, we need 4 materials such as rice bran, lime, sawdust and water and mix them together. The mixing should follow the formula, 100kg of sawdust, 10kg of rice bran, 1kg of lime and some water. A good mix, when squeezing it with finger, no water flows down, and it sticks with fingers. We should keep hidden the mix for 7 days for fermenting. During this period, we should mix it 3 times.

4) Packaging

After 7 days, we can start packaging the mix into small plastic bag. For 50kg of sawdust, we may use around 200 plastic bags. After packaging, we have to tight the plastic bag.

5) Steaming

After packaging, we need to steam the mix for 4 hours fro sterilizing. If no steaming, some fungus may grow well to compete with mushroom spores. During steaming period, we have to take care of continuous firing. After 4 hours of steaming, we take the plastic bags out of the steam-container and keep them 1 nigh.

6) Inserting spores into the mixes(small plastic bags)

We bring the steamed mixes to keep in a room for inserting spores. From 25 to 28 days, the spores will grow fully in the plastic bags. Then we arrange the plastic bags horizontally. After one week, small mushrooms appear and 3 to 4 day later, we can harvest them.

7) Production and Market

- 1 plastic bag can produce 0.8 to 1.2kg of mushroom (6-9months)
- 1 kg can be sold at 2,000 to 25,000Riels

Annex 2

Cost calculation for mushroom production (Production of 2,000 bags in each village)

Item	Unit	Village			Total Qty	Unit price ('000Riel)	Cost ('000Riel)	Cost (USD)	
		Kampong Chin	Prey Toal	Prey Pros					Prey Saneke
A Fixed cost									
1 Steam chamber									
- Kiln drum	Pc.	1	1	1	4	40	160	40	
- Steam vat	Pc.	1	1	1	4	75	300	75	
- Corrugated I. sheet(240 x 60cm)	Sheet	4	4	4	16	12	192	48	
- Nail for corrugated I. sheet	Box	5	5	5	20	0.5	10	3	
- Timber (4 x 8 x 3300cm)	Cu.m.	0.15	0.15	0.15	0.6	850	510	128	
- Wheel barrow					5	40	200	50	
2 Storehouse									
- Wood bark (1 x 2.5 m)	m.	24	24	0	48	7	336	84	
- Wood pole (large)	Pc.	20	30	20	113	1.5	170	42	
- Wood pole (small)	Pc.	100	100	0	200	0.2	40	10	
- Rope (dia 0.5cm)	Coil	2	2	2	8		0	0	
- Nail (Mixed)	Kg.	3	3	1	12	3.5	42	11	
- Complete storehouse	Unit	0	0	0	1	300	300	75	
3 Sieve									
- Timber (4 x 8 x 140cm)	Cu.m	0.05	0.05	0.05	0.2	850	170	43	
- Mesh wire (1 x 1cm)	sq.m	3	3	3	12	5	60	15	
4 Transportation cost									
Total fixed cost:							60	15	
							2,550	637	
A Variable cost									
1 Saw dust (20Kg / bag)	Bag	50	50	50	200	5	1,000	250	
2 Rice bran	Kg.	100	100	100	400	0.8	320	80	
3 Lime	Kg.	10	10	10	40	0.7	28	7	
4 Spore	Bottle	100	100	100	400	1.7	680	170	
5 PVC pipe	m.	10	10	10	10	6	60	15	
6 Plastic bag (200 bags/Kg)	Kg.	10	10	10	40	9	360	90	
7 Rubber band (400pc/bag)	Bag	6	6	6	24	1.7	41	10	
8 Plastic tape	Coil	2	2	2	8	5	40	10	
9 Firewood	Bundle	20	20	20	80	4	320	80	
Total variable cost:							2,849	712	
Total initial investment cost:							5,398	1,350	

Annex 3: Formats of Accounting Ledgers

General Ledger : Transaction Sheet

From _____ to _____

No: _____

No.	Date	Item	Received (Riel)	Paid (Riel)	Balance (Riel)	Remarks
00		B/F				
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
Total						
		C/F				

Annex 3 – 2

Product Ledger : Daily Production & Sales Record

From _____ to _____

No: _____

No.	Date	Produced (Kg)	Sold (Kg)	Used (Kg)	Stock (Packet·Kg)	Remarks
00		B/F				
01						
02						
03						
04						
05						
06						
07						
08						
09						
10						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
Total						
C/F						

Annex 3 – 3

Material Ledger : Material purchase record

From _____ to _____

No : _____

No.	Date	Item	Unit	B/F	Procured		Remarks
					Q'ty	Cost (Riel)	
01							
02							
03							
04							
05							
06							
07							
08							
09							
10							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
Total:							

Annex 3 – 4

Equipment Ledger : Equipment purchase record

From _____ to _____

No : _____

No.	Date	Item	Unit	B/F	Procured		Remarks
					Q'ty	Cost (Riel)	
01							
02							
03							
04							
05							
06							
07							
08							
09							
10							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
Total							

Annex 3 – 5

Labour Ledger : Daily Labour Record

(in hour)

Month/year : _____

No : _____

Date	Name of participant								Remarks
									(What work)
01									
02									
03									
04									
05									
06									
07									
08									
09									
10									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									
31									
Total									

Annex 4 – 1

Profit and loss calculation in mushroom production in 2006 (July to Dec.)

Kampong Chin

A. Base of calculation

- Number of members:	5 ps.
- Output:	1,014.8 kg
- Amount sold:	1,014.8 kg
- Sales income:	2,750,000 Riel
- Expenditure fixed	820,000 Riel
* Paid by SEAFDEC	687,000 Riel
* Paid by the group	133,000 Riel
- Expenditure variable	1,252,000 Riel
* Paid by SEAFDEC	1,190,000 Riel
* Paid by the group	26,000 Riel
* Paid by the group (Social welfare)	36,000 Riel
Total expenditure:	2,108,000 Riel
- Labour cost paid	0 Riel
- Share paid	500,000 Riel
- Labour contribution	1,295 hrs

B. Profit and loss analysis

	<u>Amount (Riel)</u>	<u>Amount(USD)</u>		
01. Gross sales of production	2,750,000	687.50		
02. Marketing overhead	0	0.00		
03. Net sales of production	2,750,000	687.50		
04. Incurred expenses				
- Depreciation of fixed (Depreciation for 3 years)	136,667	34.17		
- Variable cost	1,252,000	313.00		
Sub-total:	1,388,667	347.17		
05. Gross income	1,361,333	340.33		
06. Saving for future investment (20%)	272,267	68.07		
07. Net income (payment to members as shares)	1,089,067	272.27		
08. Funds to be reserved for future operation	562,000	140.50		
- Repair and maintenance cost for facilities (10%)	82,000	20.50		
- Revolving fund for production of 2,000 packets (Riel 240,000 for production of 1,000 packets)	480,000	120.00		
09. Actual share to be distributed	527,067	131.77		
10. Share already distributed	500,000			
11. Net amount of share after deduction of paid amount	27,067	6.77	Each share	5,413
12. Actual cash in hand on 31 Dec. 2006	2,055,000	513.75		
13. Total amount to be saved /reserved in the account	2,027,933	506.98		
- Reserved fund for depreciation from 2006 (to Savin Acct.)	136,667	34.17	Transferred to Saving Acct.	
- Repair and maintenance of facilities for 2007 (to Maine Acct.)	82,000	20.50	Retained in Main Account	
- Revolving fund for 2 months operation (to Maine Acct.)	480,000	120.00	Retained in Main Account	
- Saving for future investment from 2006 (to Saving Acct.)	272,267	68.07	Transferred to Saving Acct.	
- SEAFDEC saving fund for future investment (To Saving Acct.)	1,057,000	264.25	Transferred to Saving Acct.	
14. Balance(yet to be distributed to members)	27,067	6.77	To be distributed to members	
15. Economic return against initial investment cost w/o labour	166.0	%		

Annex 4 – 2

Profit and loss calculation in mushroom production in 2006 (July to Dec.)

Prey Sangke

A. Base of calculation

- Number of members:	4 ps.
- Output:	627.4 kg
- Amount sold:	627.4 kg
- Sales income:	1,646,000 Riel
- Expenditure fixed	669,400 Riel
• Paid by SEAFDEC	654,000 Riel
• Paid by the group	15,400 Riel
- Expenditure variable	1,528,000 Riel
• Paid by SEAFDEC	1,404,000 Riel
• Paid by the group	114,000 Riel
• Paid by the group (Social welfare)	10,000 Riel
Total expenditure:	2,197,400 Riel
- Labour cost paid	0 Riel
- Share paid	820,000 Riel
- Labour contribution	600 hrs

B. Profit and loss analysis

	<u>Amount (Riel)</u>	<u>Amount(USD)</u>		
1. Gross sales of production	1,646,000	411.50		
2. Marketing overhead	0	0.00		
3. Net sales of production	1,646,000	411.50		
4. Incurred expenses				
- Depreciation of fixed (Depreciation for 3 years)	111,567	27.89		
- Variable cost	1,528,000	382.00		
Sub-total:	1,639,567	409.89		
5. Gross income	6,433	1.61		
6. Saving for future investment (20%)	1,287	0.32		
7. Net income (payment to members as shares)	5,147	1.29		
8. Funds to be reserved for future operation	546,940	136.74		
- Repair and maintenance cost for facilities (10%)	66,940	16.74		
- Revolving fund for production of 2,000 packets (Riel 240,000 for production of 1,000 packets)	480,000	120.00		
9. Actual share to be distributed	-541,793	-135.45		
10. Share already distributed	820,000	205.00		
11. Net amount of share after deduction of paid amount	-1,361,793	-340.45		
12. Actual cash in hand on 31 Dec. 2006	686,600	171.65	686,600	171.65
13. Total amount to be saved /reserved in the account	1,583,793	395.95	686,600	171.65
- Reserved fund for depreciation from 2006	111,567	27.89	111,567	27.89
- Repair and maintenance of facility in 2007	66,940	16.74	66,940	16.74
- Revolving fund for 2 months' operation (from SEAFDEC input)	480,000	120.00	480,000	120.00
- Saving for future investment from 2006	1,287	0.32	1,287	0.32
- SEAFDEC saving fund for future investment	924,000	231.00	26,807	6.70
14. Balance (yet to be distributed to members)	-897,193	-224.30	0	0.00
15. Economic return against initial investment W/O labour cost		1.0 %		

Annex 4 – 3

Profit and loss calculation in mushroom production in 2006 (July to Dec.)

Prey Pros I

A. Base of calculation

- Number of members:	1 ps.
- Output:	136.4 kg
- Amount sold:	136.4 kg
- Sales income:	440,000 Riel
- Expenditure fixed	573,000 Riel
* Paid by SEAFDEC	433,000 Riel
* Paid by the group	140,000 Riel
- Expenditure variable	1,023,000 Riel
* Paid by SEAFDEC	981,000 Riel
* Paid by the group	26,000 Riel
* Paid by the group (Social welfare)	16,000 Riel
Tota expenditure:	1,612,000 Riel
- Labour cost paid	0 Riel
- Share paid	0 Riel
- Labour contribution	1,080 hrs

B. Profit and loss analysis

	<u>Amount (Riel)</u>	<u>Amount(USD)</u>		
1. Gross sales of production	440,000	110.00		
2. Marketing overhead	0	0.00		
3. Net sales of production	440,000	110.00		
4. Incurred expenses				
- Depreciation of fixed (Depreciation for 3 years)	95,500	23.88		
- Variable cost	1,023,000	255.75		
Sub-total:	1,118,500	279.63		
5. Gross income	-678,500	-169.63		
6. Saving for future investment (20%)	-135,700	-33.93		
7. Net income (payment to members as shares)	-542,800	-135.70		
8. Funds to be reserved for future operation	537,300	134.33		
- Repair and maintenance cost for facilities (10%)	57,300	14.33		
- Revolving fund for production of 2,000 packets (Riel 240,000 for production of 1,000 packets)	480,000	120.00		
9. Actual share to be distributed	-1,080,100	-270.03		
10. Share already distributed	0	0.00		
11. Net amount of share after deduction of paid amount	-1,080,100	-270.03		
12. Actual cash in hand on 31 Dec. 2006	258,000	64.50	<u>(Riel)</u>	<u>(USD)</u>
13. Total amount to be saved /reserved in the account	1,133,800	283.45	258,000	64.50
- Reserved fund for depreciation from 2006	95,500	23.88	0	0.00
- Saving for future investment from 2006	0	0.00	0	0.00
- Repair and maintenance of facility in 2007	57,300	14.33	0	0.00
- Revolving fund for 2 months' operation	480,000	120.00	0	0.00
- SEAFDEC saving fund for future investment	501,000	125.25	0	0.00
14. Balance (yet to be distributed to members)	-875,800	-218.95	258,000	64.50
15. Economic return against initial investment	-118.4	%		

Annex 4 – 4

Profit and loss calculation in mushroom production in 2006 (July to Dec.)

Prey Pros II

A. Base of calculation

- Number of members:	2 ps.
- Output:	159.0 kg
- Amount sold:	159.0 kg
- Sales income:	395,400 Riel
- Expenditure fixed	395,000 Riel
• Paid by SEAFDEC	116,000 Riel
• Paid by the group	279,000 Riel
- Expenditure variable	292,000 Riel
• Paid by SEAFDEC	187,000 Riel
• Paid by the group	85,000 Riel
• Paid by the group (Social welfare)	20,000 Riel
Tota expenditure:	707,000 Riel
- Labour cost paid	0 Riel
- Share paid	0 Riel
- Labour contribution	1,832 hrs

B. Profit and loss analysis

	<u>Amount (Riel)</u>	<u>Amount(USD)</u>		
1. Gross sales of production	395,400	98.85		
2. Marketing overhead	0	0.00		
3. Net sales of production	395,400	98.85		
4. Incurred expenses				
- Depreciation of fixed (Depreciation for 3 years)	32,917	8.23		
- Variable cost	292,000	73.00		
Sub-total:	324,917	81.23		
5. Gross income	70,483	17.62		
6. Saving for future investment (20%)	0	0.00		
7. Net income (payment to members as shares)	70,483	17.62		
8. Funds to be reserved for future operation	519,500	129.88		
- Repair and maintenance cost for facilities (10%)	39,500	9.88		
- Revolving fund for production of 2,000 packets (Riel 240,000 for production of 1,000 packets)	480,000	120.00		
9. Actual share to be distributed	-449,017	-112.25		
10. Share already distributed	0	0.00		
11. Net amount of share after deduction of paid amount	-449,017	-112.25	<u>Remedial measures</u>	
12. Actual cash in hand on 31 Dec. 2006	11,400	2.85	(Riel)	(USD)
13. Total amount to be saved /reserved in the account	358,167	89.54	11,400	2.85
- Reserved fund for depreciation from 2006	131,667	32.92	0	0.00
- Saving for future investment from 2006	0	0.00	0	0.00
- Repair and maintenance of facility for 2007	39,500	9.88	0	0.00
- Revolving fund for 2 months' operation	480,000	120.00	11,400	2.85
- SEAFDEC saving fund for future investment	-293,000	-73.25	0	0.00
14. Balance(yet to be distributed tomembers)	-346,767	-86.69	0	0.00
15. Economic return against initial investment	17.8	96		

Annex 4 – 5

Profit and loss calculation in mushroom production in 2006 (July to Dec.)

Prey Toal

A. Base of calculation

- Number of members:	4 ps.
- Output:	523.9 kg
- Amount sold:	523.9 kg
- Sales income:	1,409,900 Riel
- Expenditure fixed	981,000 Riel
• Paid by SEAFDEC	891,000 Riel
• Paid by the group	90,000 Riel
- Expenditure variable	1,337,000 Riel
• Paid by SEAFDEC	1,311,000 Riel
• Paid by the group	0 Riel
• Paid by the group (Social welfare)	26,000 Riel
Tota expenditure:	2,344,000 Riel
- Labour cost paid	0 Riel
- Share paid	800,000 Riel
- Labour contribution	1,555 hrs

B. Profit and loss analysis

	<u>Amount (Riel)</u>	<u>Amount(USD)</u>		
1. Gross sales of production	1,409,900	352.48		
2. Marketing overhead	0	0.00		
3. Net sales of production	1,409,900	352.48		
4. Incurred expenses				
- Depreciation of fixed (Depreciation for 3 years)	163,500	40.88		
- Variable cost	1,337,000	334.25		
Sub-total:	1,500,500	375.13		
5. Gross income	-90,600	-22.65		
6. Saving for future investment (20%)	0	0.00		
7. Net income (payment to members as shares)	-90,600	-22.65		
8. Funds to be reserved for future operation	578,100	144.53		
- Repair and maintenance cost for facilities (10%)	98,100	24.53		
- Revolving fund for production of 2,000 packets (Riel 240,000 for production of 1,000 packets)	480,000	120.00		
9. Actual share to be distributed	-668,700	-167.18		
10. Share already distributed	800,000	200.00		
11. <u>Net amount of share after deduction of paid amount</u>	<u>-1,488,700</u>	<u>-367.18</u>		
12. <u>Actual cash in hand on 31 Dec. 2006</u>	<u>493,900</u>	<u>123.48</u>	493,900	123.475
13. Total amount to be saved /reserved in the account	1,572,600	393.15	493,900	123.475
- Reserved fund for depreciation from 2006	163,500	40.88	163,500	40.875
- Repair and maintenance of facilities for 2007	98,100	24.53	98,100	24.525
- Revolving fund for 2 months' operation	480,000	120.00	232,300	58.075
- Saving for future investment from 2006	0	0.00	0	0
- SEAFDEC saving fund for future investment	831,000	207.75	0	0
14. <u>Balance (yet to be distributed to members)</u>	<u>-1,078,700</u>	<u>-269.68</u>		
15. Economic return against initial investment	-9.2	%		

Annex 4 – 6

Calculated Profit and Loss Analysis in Mushroom Production of 2006 (Summary)

No.	Item	Group					Total	
		Kampong Chin	Prey Sangke	Prey Pros I	Prey Pros II	Prey Total	(in Riel)	(in USD)
1	Sales (Riel)	2,750,000	1,646,000	440,000	395,400	1,409,900	6,641,300	1,680.3
2	Incurring expenses (Riel)							
	- Depreciation of facilities	1,388,667	1,639,567	1,118,500	324,917	1,500,500	5,972,151	1,493.0
	- Variables (materials + social welfare)	136,667	111,567	95,500	32,917	163,500	540,151	135.0
		1,252,000	1,528,000	1,023,000	292,000	1,337,000	5,432,000	1,358.0
3	Gross income (Riel)	1,361,333	6,433	-678,500	70,483	-90,600	669,149	167.3
4	Saving for investment (Riel)	272,267	1,287	0	0	0	273,553	68.4
5	Net income (Riel)	1,089,066	5,146	-678,500	70,483	-90,600	395,596	98.9
6	Reserve for the year of 2007 (Riel)	562,000	546,940	0	519,500	578,100	2,206,540	551.6
	- Repair and maintenance of facilities	82,000	66,940	0	39,500	98,100	286,540	71.6
	- Revolving fund for 2 months' operation	480,000	480,000	0	480,000	480,000	1,920,000	480.0
7	Available share in 2006 (Riel)	527,066	-541,794	-678,500	-449,017	-668,700	-1,810,944	-452.7
8	Shares already distributed (Riel)	500,000	820,000	0	0	800,000	2,120,000	530.0
9	Net amount share after deduction of paid amount	27,066	-1,361,794	-678,500	-449,017	-1,468,700	-3,930,944	-982.7
10	Cash in hand on 31 December 2006(Riel)	2,055,000	686,600	258,000	11,400	493,900	3,504,900	876.2
11	Actual amount to be saved / reserved (Riel)	2,027,933	686,600	0	11,400	493,900	3,219,833	805.0
12	Balance (yet to be distributed to members)	27,067	0	258,000	0	0	285,067	71.3
13	Transfer to Saving account	1,465,934	139,660	0	0	0	1,605,594	401.4
14	Economic return against capital (%)	166.0%	1.0%	-118.4%	17.8%	-9.2%		

Annex 4 – 7

Profit and loss calculation in mushroom production

Explanation Note for analysis

A. Base of calculation	
- Number of members	Working members of a group
- Output	Total quantity of production
- Amount sold	Total quantity of sales
- Sales income	Total amount of sales
- Expenditure fixed	Any expenses incurred for construction or procurement of fixed facilities and equipment
• Paid by SEAFDEC	- Paid by SEAFDEC for the above
• Paid by the group	- Paid by the group for the above
- Expenditure variable	Any expenses incurred by procurement of production materials
• Paid by SEAFDEC	- Paid by SEAFDEC for the above
• Paid by the group	- Paid by the group for the above
• Paid by the group (Social welfare)	- do -
- Labour cost paid	Any labour cost paid for employed labourers
- Share paid	Any share paid among members
- Labour contribution	Voluntary labour contribution in terms of hour
B. Profit and loss analysis	
1. Gross sales of production	Total amount of sales
2. Marketing overhead	Any expenses incurred by distribution and marketing
3. Net sales of production	Net amount of sales (1-2)
4. Incurred expenses	Incurred expenditures
- Depreciation of fixed	- Depreciation of the facilities and equipment in 3 years
- Variable cost	- Variable cost used for procurement of processing material
5. Gross income	Gross income (3)-(4)
6. Saving for future investment	Saving for future investment (20%) for reserving the fund
7. Net income (payment to members as shares)	Income after reduction of saving
8. Funds to be reserved for future operation	In case of continuation of production, some funds have to be reserved.
- Repair and maintenance cost for facilities	- Costs for repairing and maintenance for facilities and equipment (10% against the initial cost)
- Revolving fund for production of 2,000 packets	- Operational cost for production for initial 2 months (Riel 240,000 for production of 1,000 packets)
9. Actual share to be distributed	After reserving the above fund, one can share the net income.
10. Share already distributed	The amount of money already distributed during course of operation.
11. Net amount of share after deduction of paid amount	Net amount that a group can receive as shares (12 - 13)
12. Actual cash in hand on 31 Dec. 2006	Actual calculation is not as above because most costs were borne by SEAFDEC and the amount cash in hand differs.
13. Total amount to be saved /reserved in the account	In reality, some necessary fund should be reserved or put them aside.
- Reserved fund for depreciation from 2006	- Reserved fund from depreciation cost saved in 2006
- Saving for future investment from 2006	- Saving for future investment 20% from gross income of 2006
- Repair and maintenance of facilities for 2007	- Funds to be reserved for repair and maintenance of facilities in
- Revolving fund for 2 months operation	- Operation cost for the next 2 months (this is disbursed from SEAFDEC Fund)
- SEAFDEC saving fund for future investment	- Ideally, all the amount of kick-off fund disbursed by SEAFDEC should be kept as special savings for future investment; namely: SEAFDEC contribution for variable cost in 2006
	- To be used as the revolving fund for 2007.
14. Balance	After deduction of reserved funds from cash in hand (this can be distributed among members.)
15. Economic return against initial investment	Efficiency rate of investment measured by gross income against initial investment cost. (operational capital is not included)

Annex 5: Photos on mushroom production



Training course in mushroom production



Training in Bookkeeping and accounting



Facilities of mushroom production



Packing in plastic bags



Storing mushroom bags



Cultivation of mushroom



Ready to cultivate



Oyster culturing bags