

Socio-Economic Situations of Dwellers in Mangrove Ecosystems

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This study aims to investigate and assess socio-economic aspects of mangrove dwellers in order to gain more understanding of the mangrove community. Baseline data and results obtained from this study may be useful for developing the mangrove management plan aiming to improve the income and traditional way of life of the mangrove dwellers. Ko Lao and Had Sai Khao villages of Ranong Province located in Southern part of Thailand were chosen purposively. Both villages contain about 26 households each. The data needed for study were obtained by interviewing each house-hold head with questionnaires. In addition, observation of daily life of mangrove dwellers were also made. Ko Lao village composes of two different religions; Muslim and Buddhist while the Had Sai Khao dwellers are only Buddhists. The present population of Ko Lao had migrated from the Southern part while the majority of Had Sai Khao population came from the central part of Thailand. On the average, Ko Lao households have larger family size (5.6 persons) than the Had Sai Khao holds (4.6 person). The main occupation of dwellers in both villages is fishing. The mangrove dwellers in both villages used the mangrove woods for cooking, fishing gear and house construction. On the average Ko Lao households are relatively poor compared with the Had Sai Khao households as they earn less income. Shrimp paste making is the major income for the Ko Lao dwellers whereas the sea fishery without processing generates the major annual income for the Had Sai Khao villagers. Getting an adequate supply of fresh water for drinking and other domestic uses is the common problem facing two mangrove communities.

Tasle 1 household consumption expenditures, and net family income of the Ko Lao and Had Sai Khao villages.

Items	Ko Lao Villages						Had Sai Khao Village	
	Buddhist		Muslim		Total		Total	
	B/HH*	%	B/HH*	%	B/HH*	%	B/HH*	%
A. Average household Income	36,699.9	—	26,267.7	—	31,885.1	—	63,978.9	—
B. Production expenses :	19,129.9	40.5	13,207.3	37.3	16,396.4	39.3	19,368.4	30.8
Fishery	6,082.2	12.9	2,437.4	6.9	4,400.0	10.3	19,242.3	30.6
Shrimp paste making	13,047.7	27.6	10,769.9	30.4	11,996.4	28.8	—	0
Charcoal making	—	0	—	0	—	0	126.1	0.2
C. Household consumption expenses	28,086.1	59.5	22,194.5	62.7	25,365.0	60.5	43,591.3	69.2
D. Total expenses (B + C)	47,216.1	100.	35,401.8	100.0	41,763.4	100.0	62,959.7	100.0
E. Net family income (A-D)	-10,516.2	—	-9,134.1	—	-9,873.3	—	1,019.2	—
F. Total cash expenses	29,203.2	—	21,899.3	—	25,832.2	—	47,920.6	—
G. Net family cash income (A-F)	7,496.7	—	4,368.4	—	6,052.9	—	16,057.4	—

* Household

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I. Significance of Socio-Economic Research of Mangrove Communities

One major constraint on the development of mangrove resource management plan for the improving of the quality of life of mangrove dwellers is the lack of the basic information and knowledge of various aspects, e.g. community structure, resource utilization and economic condition of these people living in mangrove communities. The decision on future use of mangrove ecosystems which are based on inadequate knowledge of these people may results in unanticipated hardship for mangrove dwellers and irrevocable loss of value mangrove resources. Therefore, it is essential that intensive research of such mangrove settlement, which depend mainly on the productivity of the mangrove forest must be carried out. Baseline data and results obtained from this socio-economic research are useful for developing the mangrove management plan aiming to improve the traditional way of life of the mangrove dwellers.

II. Conceptual Framework of Socio-Economic Features

Basic concept for socio-economic research on the mangrove dwellers can be summarized and presented in the Figure 1. This figure shows the integrated system composing various components of socio-economic features of mangrove community. It implies that these components and their intercorrelations are essential and have to be taken into account on the study and analysis aiming to gain more understanding on the socio-economic aspects of the mangrove dwellers.

In order to enable to analyse and assess the socio-economic features of the mangrove settlers, the following data and information are needed to collect :

1. Socio-Demographic Characteristics

- population origin
- household size and composition
- educational background
- religious background
- current and former occupation

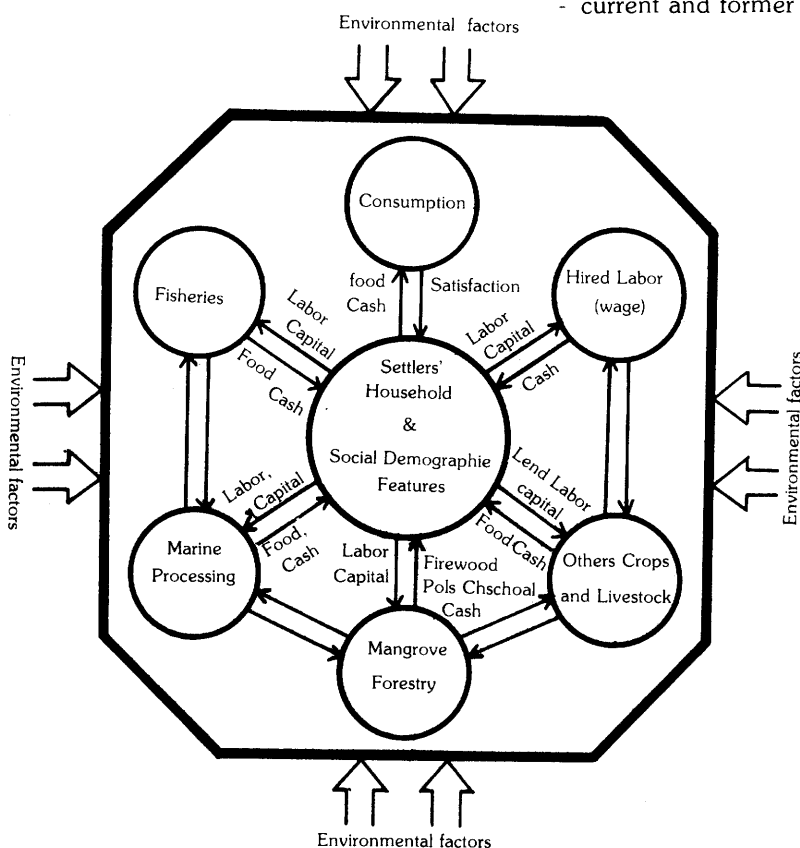


Figure 1 : Socio-Economic System of Mangrove Dwellers

- migration
 - perception and responsiveness
 - Scurrent Problems
 - others
2. Economic Features
- resource utilization
 - household income and source of income
 - household expenditures (household consumption expenses and production expenses)
 - household asset and indebtedness
 - product prices and local marketing system
 - problem faced
 - others

III. A Case Study Approach of Mangrove Villages in the Southern Thailand

This case study is an effort to investigate and assess socio-economic characteristics of mangrove dwellers in the Southern part of Thailand. The study was carried on in Ko Lao and Had Sai Khao villages of Ranong Province. These two villages were chosen purposively for several reasons. They provide good samples of different groups of mangrove dwellers. In Ko Lao, the mangrove dwellers are Muslims and Buddhists but in the Had Sai Khao village they are exclusively Buddhists. The size of both villages have about the same size and similar composition of about 26 households each. They are located on the coastline of the Ranong estuary and about 4 km. from each others. The data of socio-economic characteristics of mangrove households were collected by means of interviews based on a questionnaires and a survey in 1984. In addition, observation of daily life of mangrove dwellers were also made.

3.1 Population Origins

Ko Lao and Had Sai Khao villages are situated in the vicinity of mangrove forests of the Ranong estuary. Both villages were founded more than 23 years ago. Formerly the two villages had been inhabited a long time ago by a Muslim group of unknown origin namely "Chao Nam" (meaning fishermen in Thai). Unfortunately, no respondents in these villages seemed to know where this pioneer group had come from and where they had gone to.

For all household heads in both Ko Lao and Had Sai Khao villages the most common reason given for migrating to this area was the attraction of the abundance of marine animals and mangrove forest in the area. Many of them were facing problems of population pressure and had less opportunities to earn an income for their families in the other areas. They are looking and searching for some areas like Ko Lao and Had Sai Khao island in which there are still plenty of marine animals for them to catch.

Both communities are relatively small containing about 26 households each. They are similar in having a linear settlement pattern. Total censused population of Ko Lao and Had Sai Khao communities was 151 and 119 respectively. Ko Lao village contains both Muslims and Buddhists while the Had Sai Khao dwellers are only Buddhists. In Ko Lao village, 52 percent of the total population are Buddhists and 48 percent are Muslims.

The present population of Ko Lao migrated from the South while the majority of the Had Sai Khao population came from the central part of Thailand. Therefore, different dialects are spoken in the two mangrove villages. Ko Lao dwellers use a Southern dialect including Malay whereas the Had Sai Khao dwellers use the Central dialect.

3.2 Household Size and Composition

On the average, Ko Lao households have larger family size (5.6 persons) than the Had Sai Khao households (4.6 persons) as can be seen in Table 1. In addition more children are found in the Ko Lao families than the Had Sai Khao. This may imply that the Ko Lao families have a higher birth rate.

Household labor force (age 15-54) in Ko Lao community averaged about 2.9 persons or 50 percent of the household members. About half (1.5 persons) are males. This implies that the mangrove dwellers in the labor force of Ko Lao village have to work hard to maintain a subsistence level for their families. Since a large proportion of their family members is composed of children and elderly people (age of more than 55 years old) who have to be taken care of by relatively few people in the household labor force. This can be seen clearly from the ratio of dependants to family

members in the working ages or the number of workers in the family. This dependency ratio of approximately 1.01 means that each family worker has to support one dependant. The ratio is much higher for Muslim (1.21) than for Buddhist households (0.86), principally because of the higher proportion of children in Muslim households. For Had Sai Khao community, the villagers have approximately 2.8 persons per family (61 percent) of working age with a dependant to worker ratio of 0.63. Comparison of the age composition of the two villages shows that a larger proportion of family members in Ko Lao is composed of young children than in Had Sai Khao. This difference suggests that the Ko Lao households have heavier burden for looking after their dependants than the Had Sai Khao households.

3.3 Education

Thailand has for a long time legislation requiring all children to enter primary school at age 7, in order to improve literacy of the rural people. School attendance is compulsory between the ages of 7 and 13. This corresponds with the six primary grade. However, illiterate people accounting for 23 and 17 percent of the total population were found in Ko Lao and Had Sai Khao respectively. Fortunately, the present education situation seems to be getting better than in the past due to the fact that there is now a primary school with 6 teachers in Ko Lao and 5 teachers in Had Sai Khao offering education up to Grade 6. Among the educated residents of both villages, a relatively large number of them are educated to Grade 4 accounting for 20 and 24 percent for Ko Lao and Had Sai Khao communities respectively.

3.4 Occupation

The main occupation of residents of both villages is fishing. The fishing gear used are very similar and the simple equipment for fishing are scissor net, barrier net, winged set-bag-net, gill net, crab net trap, etc. The majority of the villagers are small-scale fishermen. Shrimp paste making appeared to be the major occupation for 80 percent of the total population in the Ko Lao village. While fishery without processing (i.e. catching and selling various fresh marine animals) was done as the major income earned by 90 percent of the Had Sai Khao households.

3.5 Use and Perception of Mangrove Resources

Residents of both villages used the mangrove wood for cooking fishing gear and house construction but the cutting of wood is illegal. Charcoal making from mangrove wood was seen only in Had Sai Khao village and consequently the mangrove dwellers in this village used more charcoal for cooking than those in Ko Lao village where more firewood was consumed. The majority of villagers would like to conserve the mangrove forests for fishery production.

Both Ko Lao and Had Sai Khao are traditional fishing communities confining their activities to the inshore and near shore zone, and only the juvenile or young stage of economic species are captured by the simple traditional methods. The quantity of the catch among each family varies from 540 to 4,000 kg. per year.

Of those not born in Ko Lao village almost 91 percent of Buddhist respondents were cash crop farmers before they moved to Ko Lao. No one from the Buddhist families has been in fisheries. For Muslim, the previous occupation was dominated by fisheries. About 29 percent were hired workers and 11 percent were formerly orchard owners.

In case of the Had Sai Khao community, almost 62 percent of respondents had faced a problem of shortage of farm land for growing cash crops or rubber. These problems of land shortage caused them to migrate to this community. About 38 percent of respondents moved to Had Sai Khao because they would like to pursue a career as fishermen. The reasons for migrating to Had Sai Khao are implied by the former occupations of the household heads.

According to interviews with household heads in both survey villages, the living condition in their villages are difficult, as they earn less income than before due to the decreasing number of mature sea animals and the deterioration of the mangrove forest around the island. They also indicated that if the situation gets worse due to the decline of their catch of marine animals and of mangrove forest products, they may migrate out of these communities to other places which offer better opportunities for them to work as fishermen.

All land in either Ko Lao and Had Sai Khao island has been declared public land. Because

the mangroves around these islands are part of a forest reserve, the mangrove dwellers cannot own land in their villages, but they are allowed to build their own houses on the seashore around the islands. The houses are built close to each other. On the average, each home lot of a mangrove dweller family occupies about 15 to 20 square meters of land area.

With regard to the matter of leadership, the village head appeared to receive the highest credit from all respondents in both communities as the leader of the community development project. The next important leader for the community development project was the local teacher.

3.6 Household Economy of the Mangrove Dwellers

Although Ko Lao and Had Sai Khao villages are situated on different islands which are not very far from each other, there are many economic differences between them. On the average Ko Lao households are relatively poor compared with the Had Sai Khao households as they earn less income. Shrimp paste making is the major income for the Ko Lao dwellers whereas the sea fishery without processing generates the major annual income for the Had Sai Khao villagers. There are no Ko Lao households which earn their income from charcoal making but some of Had Sai Khao households obtained supplemental income from making and selling charcoal. No other income was earned by mangrove dwellers from either village or forestry business.

Table 1 reveals that average income earned by the Ko Lao households for the whole year is approximately 31,855 baht per household. Shrimp paste making accounts for the largest contribution to the household income. It generates 17,539 baht per household or 54 percent. Fisheries are also a very significant income earning next to shrimp paste making, as it contributes 9,011 baht per household or almost 30 percent. Wage income accounts for only 12 percent, but it may be regarded as important especially for those households which have a large labor force. On the average, the Buddhist households earn more annual income than the Muslim households. According to Table 1 the Buddhist households

average an annual income of 36,700 baht whereas the Muslim households generate 26,268 baht per year for their family.

The annual income of the family in Had Sai Khao households is more than twice that of the Ko Lao households. An average annual income of the Had Sai Khao households is about 63,979 baht per family. The composition of income earned differs in the two villages. Unlike the Ko Lao community where sales of shrimp paste predominates, fisheries appeared to be the major income earning for the Had Sai Khao households. The fisheries without processing contributed to nearly 86 percent of the total annual income of the Had Sai Khao households. Whereas shrimp paste making was the major source of household income for the Ko Lao families, there is no shrimp paste making in Had Sai Khao community where most of the villagers came from families that were never involved in shrimp paste making. Wages are apparently the next important source of income for the Had Sai Khao families, accounting for approximately 8 percent of the total annual income. Demand for hired labor, like fishery crews came from those households who are operating relatively large scale of fisheries. Thus the Had Sai Khao households that have more adult males in their families have more opportunities to hire out their family workers as a fishing crew in this village. Commercial charcoal making is found in two households, while four households produced charcoal for their own use.

Two households in Had Sai Khao village were found to buy fish for resale in Ranong and also engage in fishing for themselves. Therefore, Had Sai Khao fishermen have an option to sell their catch either to these two village merchants or merchants in Ranong. Most sell their marine animals to the two merchants in their village, since it is more convenient. When the catch of fish and other marine animals is big enough to cover the shipping cost from the village to the provincial town of Ranong, they may sell it to the merchants in Ranong.

A summary of household production expenses included outlays on family fisheries, shrimp paste and charcoal making in both mangrove communities. In Ko Lao village, the average outlays

of all families for fisheries and shrimp paste making are 17,396 baht per household per year. This figure is composed of 12,996 baht and 4,400 baht per household for fisheries and shrimp paste making respectively. These household production costs account for 53 percent of the total household income. It should be indicated that the total household production expenses include not only cash expenses but also non cash or unpaid expenses. The reason for this is that there are some inputs in the household production process are drawn from their own family supplies and production, such as family labor and small shrimp. For instance, total cash expenses (associated with salt, fuel, lubricant, repairs and transportation) account for only 14 percent of the total production of shrimp paste.

The proportions of household consumption expenditures were found to be different between the two mangrove communities. Food consumption of the Ko Lao households takes a larger proportion (84 percent) of all household consumption than the Had Sai Khao households (73 percent). It was observed that the value of all household consumption exceeds the annual household income of Ko Lao families. They can service because 50 percent of food consumption expenditures other than rice were not paid as they were drawn in kind from their own family business.

Net family income is defined as the difference between the total household income and total household expenses of consumption and production. Net family income indicates how much the households have left after all non cash and cash expenses are subtracted from the total household income.

If all transaction were based on cash households in Ko Lao village would have an average annual negative income of 9,873 baht per household. This is possible as there are some noncash expense items or unpaid items to be included in the family consumption and household production as mentioned earlier. If all unpaid items are excluded from household consumption and production expenses, the total cash expenses can be derived. Ko Lao households spend an average of 25,832 baht in

cash for their family consumption and production. When only cash expenses are concerned and subtracted from the household income, the rest becomes the net family cash income averaging 6,053 baht a year or 504 baht per month. The Buddhist households have more net family cash income than the Muslim households. On the average, the net family cash income earned per year is 7,497 baht and 4,368 baht for the Buddhist and Muslim households respectively.

Had Sai Khao households have a higher net family income as well as a net family cash income than those of Ko Lao. The Had Sai Khao families earn a net income of 1,019 baht a year while the Ko Lao families have a negative net family income, if both cash and noncash expenses are subtracted from their total income. On the average, the Had Sai Khao households can generate a net family cash income of about 6,058 baht per family per year (or 1,338 baht per month), while the Ko Lao households make only 6,053 baht per year in net cash income.

Indebtedness appears to be very low during 1983 among Ko Lao village households. The average debt at the end of 1983 of each households which had borrowed was about 800 baht. Only two out of 14 Buddhist households (14 percent) still were in debt, averaging 100 baht per household at the end of 1983, while 7 out of 12 Muslim households (58 percent) were found to carry a debt of 1,000 baht per household. Approximately 35 percent of the total respondents had borrowed during 1983. With an average of 718 baht borrowed per household. A higher proportion of Muslim households borrowed, but the amount borrowed was less than that borrowed by Buddhist households. Only two (14 percent) of Buddhist households had borrowed for 750 baht per household in the 1983, while 58 percent of the Muslim households had borrowed an average of 680 baht per household.

Friends and a relatives are the only source of loan for all borrowing households in Ko Lao village. No interest is charged.

The borrowed money was mainly used for both consumption and production. About 54 percent of the borrowed funds were used for household consumption, while 45 percent were allocated to production costs (i.e. buying gasoline, fuel, lubricant, salt for household fisheries and shrimp paste making, etc).

For the Had Sai Khao households, there are 8 out of 26 respondents (31 percent) reported to have borrowed money during 1983. The average amount borrowed in 1983 by these households was about 2,950 baht. Their reason for borrowing is due to their indebtedness incurred at the beginning of the year averaging 3,788 baht per household. Households which had borrowed in 1983 paid back 934 percent of the total loans. 6,744 baht. Therefore, the households, indebtedness found at the end of 1983, was an average of 445 baht per household.

The major sources from which Had Sai Khao residents borrowed money included not only friends and relatives but also the village merchants. In general, the interest rate charged by the village merchants is about 20 percent per year, while the interest is 15 percent per year for loans from friends and relatives. It should be noted that for religious reasons Muslims pay no interest on Loans.

According to an interview with the two village merchants who had given loans, the village merchants have to charge a relatively high interest rate, as they want to force the borrowers to pay back the loan faster. In addition, the village merchant indicated that it is very risky to give a loan to a householder in Had Sai Khao village, because there are no secure household assets that can be used as the borrowers' collateral. The local merchants have to take the risk of loaning to the Had Sai Khao households as a part of their business strategy to have a close linkage with the households. Consequently, the borrowers are forced indirectly to sell their marine products to the village merchants who are the lenders.

There were great differences in the purposes for which loans are used between the Had Sai Khao and Ko Lao households. Had Sai Khao households tend to use their loans more productively than Lao households. Nearly 90 percent of the money borrowed by Had Sai Khao households was spent on household production, while only 10 percent of the loan was used for consumption.

3.7 Economic Problems of Mangrove Dwellers

Getting an adequate supply of fresh water for drinking and other domestic uses is a common problem facing two mangrove communities. Eventhough Ko Lao village has three dug-wells, only one of these can supply good quality water throughout the year. Ko Lao villagers expressed a strong need for having one or two additional dug-wells in their village. Had Sai Khao households have to go to a source of fresh water which provides water all year round nearby Ko Kew island. It is very inconvenient and risky for them to carry the water by boat in the heavy and bulky water containers from there to Had Sai Khao. There are a few large jars for water storage in both villages but they belong to the schools and will be used only by teachers and students. The villagers can only use them when the water in the dug-wells is insufficient.

Another great problem indicated by the households in each mangrove village was sudden illness of their family members. The overall health care, sanitation and general well-being of dwellers in these two villages are very poor. They need urgently a programme to solve these problems especially the problems that concern the young people of both villages for a better quality of life in the future.

IV. Conclusion and Recommendations

The results of the studies on the socio-demographic characteristics, economic situation and other aspects of the households in these two mangrove villages reveals their unsatisfactory problems that should be alleviated and overcome by the government or the concerned institutes

in order to assist the mangrove dwellers in both villages to get better living standards, before the situation is getting worse and hard to solve in the near future.

Based on the study results, some important suggestions and recommendations are presented here :

1. An adult educational programme should be established in both Ko Lao and Had Sai Khao villages in order to assist the illiterate persons. For there is a relatively high percentage of illiterates especially in the Ko Lao community.

2. Based on the family composition found in two mangrove villages, the Ko Lao households are facing a problem of population pressure and burden for the family as 44 percent of their family member are children (aging 13 years old). Therefore, a birth control programme should be set and implemented in this village in order to reduce a population pressure in the near future. However, the Muslim households were found to have more children than the Buddhists, they may need to establish a certain kind of natural birth control programme that will not be in conflict with their religious beliefs.

3. As fishery is one of the important occupation of many households in both mangrove communities, other fishery operation like small scale and not too expensive programmes like raising fish as in the cages should be considered and tested on its feasibility, as they may give more opportunities for the villagers to work besides their sea fishery. Especially since it is expected that in the near future the sea fishery around Ranong estuary will be less profitable and more costly, due to a rapid decrease in the supply of marine animals in this area. This implies that the two mangrove villages should receive more attention from the Department of Fisheries and other related agencies. Demonstrations of aquafarming techniques at the village level should also be made.

4. Most of the marine animals catch by the fishermen from both villages were sold fresh, since there is no processing techniques. Only shrimp paste making was seen in Ko Lao village and it was found that the shrimp paste was produced

by the old and in a primitive ways, consequently the quality was low and the paste making time consuming. This causes that the Ko Lao households receive a low price for their shrimp paste and so earn less income. In order to improve both quality and quantity of shrimp paste products, some appropriate production techniques related to shrimp paste making should be introduced to the households in Ko Lao and also in Had Sai Khao where shrimp paste is not produced at present. Other fish processing techniques should be also demonstrated to the dwellers in both villages so that they can earn more income instead of only selling fresh fish.

5. In case of utilization of mangrove woods, the government through its Royal Forest Department should provide a definite area of the forest or a so-called "forest village" to the villagers for firewoods and the making of charcoal and timbers for house construction. The village forests should be taken care off by the villagers. The arrangement of forest village will assure the villagers to be direct beneficiaries of the mangrove forest. Since they can legally utilize mangrove resource belonging to their community. Therefore, the villagers are willing to protect the forest or to participate in other forest activities contributing to conservation of mangrove forest such as reforestation.

6. Fresh water supply for drinking was the urgent need for the two mangrove communities. Since the rainy season in this area cover about 8-9 months a year, one possible and cheap source of fresh water is the collection of rain which should be considered as a means to overcome a lack of fresh water supply. Most of the households reported that only a little amount of rain can be kept because they have no enough water containers. This problem of a shortage of fresh water can be eliminated if the mangrove dwellers can be trained to make a cheap water container by their own. A programme on this matter has already been established and is available under the responsibilities of the Department of Community Development (DCD). Therefore, the local government of Ranong can make a request and ask for help from DCD. The government may provide 2 or 3 water containers to each

village for the collection of rain water for public consumption in case a severe shortage of fresh water suddenly occurred. In addition, an investment programme for one or two public dig-wells in each mangrove village is also recommended to provide a supply of water for the household domestic use besides drinking.

7. First-aid health care services are also necessary for Ko Lao and Had Sai Khao communities as the dwellers commonly face a problem of various sudden illness of their family members. In order to avoid a bottle neck for the local government budget constraints by building a standard health care service center a viable and less expensive health care service programme is recommended. A good example of this kind of programme is the village medical bank and a short-term training programme for one or two selected villagers to become local or village health care officers, who know how to give a first-aid services or simple medial services to the villagers. Some plants from mangrove forests can be used as alternative as medicine but they need scientific proof, on their effectiveness and an possible side effects.

8. An organization (cooperative) among the households which have the same interests and concerns should be set up, before the above suggested programmes and actions will be implemented. Because such recommended programmes may not be effectively corried out without a good cooperation among the mangrove dwellers.

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