

2.1.5 Fisheries and Aquaculture

(1) Aquatic Fauna in SLB

SLB is known to be a home of highly diversified aquatic fauna species. Previous studies in Songkhla Lake have listed more than 500 species of freshwater and brackish water fish, around 30 species of shrimp, mantis shrimp and serrated mud crab, and around 20 species of squid. Dominant species found include: knife fish, striped tiger nandid, mystus, sheath fish and freshwater shrimp in Thale Noi; giant catfish and Indian anchovy in Upper Songkhla Lake; giant catfish, orange mouth anchovy, Gunther's walking catfish and marine shrimp, especially yellow shrimp, in Middle Songkhla Lake; a variety of marine shrimp, mullet, seabass, marine catfish and sandwhiting in Lower Songkhla Lake; and knife fish, sheath fish, freshwater eel, climbing perch, Gunther's walking catfish, blue gourami and freshwater shrimp in Phru Kuan Kreng.

Some aquatic fauna species have been reported to have, or almost have been extinct from SLB, such as Nieuhof's walking catfish (*Prophagorus nieuhofii*), Pla Prom (*Thynnichthys thynnoides*) Pla Mein (*Osphronemus goramy*) Pla Toom (*Puntius bulu*) Pla Lampam (*Puntius schwanenfeldii*), as well as some aquatic animals living in the Basin such as Otter (*Lutra* spp.) and Painted Stork (*Mycteria leucocephala*), and most importantly, **Irrawaddi dolphin** (*Orcaella brevirostris*). In the most recent survey, carried out during 2000 – 2001, it was estimated that there was only one herd of approximately 25-50 Irrawaddi dolphins, and that about four die each year. A recent report was made in mid-2004 where a herd of 20 – 40 dolphins was spotted.

(2) Fisheries in SLB

Fisheries in Songkhla Lake differs spatially according to resources conditions in each part of the Lake. Most intensive fishing activities are found in Lower Songkhla Lake, and considerably less intensive in other parts of the Lake. A lot of fishing activities in Phru Kuan Kreng are active during and after floods. Fishermen also excavate fish-trap ponds to trap fish which come with floods and seek refuge as surrounding water recedes, and dewater the ponds to harvest fish in the dry season. NICA reported that, in 1995, there were 8,006 fishing household living in 158 villages around Songkhla Lake.

- **Fishermen community:** Most fishermen in SLB are local indigenous people. Typical fishing households have some portions of the Lake near their home or their communities designated for fishing since their ancestors' time. They generally install stationary fishing gears, such as sitting cage, set bag net, stationary lift net and bamboo stake trap. A survey indicated that the Lake areas for installing stationary fishing gears were originally obtained by claims. Thereafter, ownership was transferred either through inheritance or sale. In the case of sale, price varies depending on types of fishing gears and amount of fish catches in each location.

In the Lower Songkhla Lake where fishing activities are most active all year round, it is found that 73.2% of fishermen depend solely on fishing as their livelihood. The remaining 26.8% has other occupations, additional to fishing. In Thale Noi where a large proportion of population do fishing, and fishing activities are performed all year round, only 10% of population depends solely on fishing. The remaining 90% has other occupations, in addition to fishing. Given that fishery in Songkhla Lake is small-scaled in its operation, fishermen who live solely on fishing or take fisheries as their primary occupation are those who often have constraints or limited access to other resources. They thus have little option for livelihoods. Deterioration of fishery resources poses serious impacts upon these groups of population.

- **Fishing Gears:** Various types of fishing gears are found in the Lower Songkhla Lake, such as sitting cage, bamboo stake trap, stationary lift net, set bag net, beach seine, trammel net, gill net, push net, seabass gill net and cast net etc. Some of these gears, such as beach seine, stationary lift net, set bag net and seabass gill net are used only in the vicinity of the Lake estuary. Other types of fishing gears such as sitting cage, bamboo stake trap, trammel net, small-surrounding net, fish trap, hooks and lines etc., are used only in the Upper Songkhla Lake. While gill net, barrier and trap, small-surrounding net, eel trap, hooks and rods, cast net and large lift net are used in Phru Kuan Kreng. Large lift nets are usually found in stream estuaries and vicinities. Furthermore, fish-trap ponds are widely found in Phru Kuan Kreng. It should also be noted that illegal and destructive fishing methods, such as electrification and fish poisoning, can still be found in the Phru Kuan Kreng area.

The report of Department of Fishery (as of 30 September 2003) indicated that there were: 2,074 set bag nets; 29,604 sitting cages, placed in 354 rows; 66 stationary lift nets; 422 large lift nets; and 9,687 bamboo stake traps, placed in 307 rows; found in Songkhla and Phattalung provinces. Set bag nets, sitting cages and stationary lift nets were mostly found in Songkhla, and the rest were found in Phattalung. There were also 130 push-net boats, which are considered destructive, still operating in Songkhla Province.

- **Fish Catches in Songkhla Lake:** There were only 2 major and systematic studies on fish catches in Songkhla Lake in the past: the first one was conducted during 1984 – 1986 and the second during 1994 - 1995. These studies reported the total fish catches during 1994 – 1995 to be 9,634 tons/year (528; 5,745 and 3,361 tons/year respectively from Thale Noi, Upper Songkhla Lake and Lower Songkhla Lake), a reduction of 22% compared to 12,290 tons/year during 1984 – 1986. The same studies indicated that the catches per household have decreased sharply in Thale Noi, a little in the Upper and Middle Songkhla Lake, and very much increased in the Lower Songkhla Lake.

In 2003, the Marine and Coastal Resources Department carried out the study on the fish catches using set bag net and sitting cage. For set bag net, the study was unable to make a lucid conclusion that the trend of fish catches has decreased, but indicated that most of the fish caught have been smaller in size and the proportion of shrimp that has higher values than fish has decreased. For sitting cage, the study concluded that the trend of fish catches have steadily decreased. The average catches per unit has decreased significantly from 3.6 kg/day in 1996 to 0.9 kg/day in 2002, a decrease of fourfold. ***In sum, the decline of fishery resources has widely been perceived by fishermen as well as concerned government officers. However, the existing quantitative data are not sufficient to lead to rational conclusion as to how much the fishery resource has dwindled.***

(3) Aquaculture in SLB

There are several types of aquacultures in SLB. The first notable is cage aquaculture. Seabass aquaculture is the most common form of cage aquaculture. At present, there are 5,199 fish cages owned by 1,433 fishermen with production of 910 tons/year, valuing approximately 82 million baht/year. There are also 343 fish cages for rearing freshwater fish such as Nile tilapia, owned by about 140 fishermen, with the production of 123.9 tons/year, valuing approximately 5.6 millions baht/year. The second notable one is tiger prawn culture in pond which has been widely practiced around Songkhla Lake over the past 20 years. It was reported that in 2002, over 13,000 tons of tiger prawn were produced valuing approximately 3,800 million baht.

(4) Establishing New Fisheries and Aquaculture Order

The physical characteristics of some areas of Songkhla lake pose certain limitations for some fishing activities. The soft clayey bed of the Lower Songkhla Lake, from Pak Ro to Ko Yor, is not suitable for fishing using surrounding net. The very weak current in Upper Songkhla Lake make it unfit for

fishing using set bag net and sitting cage, but suitable for catching giant river prawn and fishing using trap. The strong tidal effect in the Lower Songkhla Lake makes set bag net and sitting cage fishing very effective. Thus, it seems that fishery zoning has been drawn by virtue of the Lake characteristics. The issue is that there are too many fishing gears of some types, especially set bag net and sitting cage, used in certain areas, particularly in the Lower Songkhla Lake. Consequently, the catches per unit effort have steadily declined, let alone smaller sizes of fish caught. It is thus necessary to reduce the number of these fishing gears, if the abundance and diversity of the aquatic animals are to be restored. At the same time, illegal and destructive fishing methods, such as push-net fishing, electrification and fish poisoning, must be brought to a halt. Guidance measures for establishing new fishery and aquaculture order are as follows:

- **Set bag net:** is used to trap small fishes and shrimps in a relatively deep channel, and relatively strong current. Given its very location, set bag net often lies on navigation channel of medium and large fishing boats which operate in the Gulf of Thailand and Lower Songkhla Lake, oftentimes leading to disputes. Reorganizing set bag net fishing should focus on solving the most critical problem, i.e., allowing maximum number of set bag net which still permits considering the fishing capacity of the area and sufficient supply of small fish to feed cage aquaculture, or the maximum number which does not cause fish catches to decline. The set bag nets that obviously obstruct public navigation channel should be removed. It is also important to consider that the affected fishermen must be compensated and/or retrained for new fishing gears or new occupation, as the case may be.
- **Sitting cage:** is a small size fishing gear used for trapping fish and shrimp by combining with wing-like barriers. Its production per unit is rather low. By virtue of its nature, it is very simple and non-destructive. The problem is their number. There are currently around 25,000 units of sitting cage located in the Lower Songkhla Lake, causing the catches per unit effort steadily decreased; from about 1.5 kg./unit effort/night in 1978 to about 0.6 kg. /unit effort/night in 2003. Measures to reorder sitting cage should focus on reducing the number of this gear as much as possible, while fishermen can still make their living. Furthermore, the number of rows, and distance between sitting cage should be regulated appropriately.
- **Other types of gear:** which may cause decrease of aquatic lives, strict law enforcement should be encouraged, while working with local fishermen network in trying to bring a cessation to these destructive fishing practice. Programs should be introduced to retrain these fishermen to use other more appropriate fishing gears.

In putting selected fishing gears to a halt, or even reducing certain gears, consideration should be given to consequences which might occur to fishermen and people with related occupations. Drastic or abrupt change may lead to serious socio-economic impacts upon local people. Thus, a close public consultation and continuous monitoring should be made when dealing with these delicate issues.

Most important in regulating the fishing gears is that the process must appropriately involve stakeholders' participation, especially fishermen who will be most affected. The public must be involved throughout the whole process, from problem identification, conceptualization, planning, decision making to operation, in the form of "Co-management". Appropriate rules and regulation may be initiated for community organization or local administrative organization to play significant roles.

As for aquaculture, it is recommended that concentration of fish cage culture in certain areas should be avoided; and redistributed appropriately. The authorities should promote "good" aquaculture practices, and provide appropriate technical assistance to the fishermen.