

Lessons on Project Design and Stakeholder Engagement from the Songkhla Lake Case

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Introduction

Songkhla Lake Basin (SLB) is situated in southern Thailand, lying in 3 provinces: Phattalung, Songkhla and Nakhon Si Thammarat. Shown in Fig.1, SLB covers approximately 8,729 sq.km. consisting of approx. 7,687 sq.km. of land area and approx. 1,042 sq.km. of the Lake area.

Not only is Songkhla Lake the only natural lake in Thailand, it has unique characteristics. It is a *3-water ecosystem*. The mixing of fresh water runoff and overland flow, and saline water from the sea, causes its salinity to vary spatially and temporally. Three distinct parts in Songkhla Lake are distinguished: fresh, brackish and saline water. Songkhla Lake consists of 4 parts: Thale Noi in the northernmost part which is fresh all year round; Upper Songkhla Lake; Middle Songkhla Lake and Lower Songkhla Lake. The latter is connected to the Gulf of Thailand at Muang District, Songkhla Province. Most part of the lake is 1.5 - 2 meter deep.

The complex ecosystem has made Songkhla Lake rich in biodiversity, forming a life supporting system which has long accommodated living, as well as other economic activities for SLB inhabitants which stood around 1.6 million in 2004. Major economic activities at present include rubber plantation, paddy rice farming, fruit tree orchards, fishery, aquaculture and husbandry. In addition, SLB is a land with long records of arts and culture, rich historic and archeological remains, not to mention natural beauty, making SLB potentially viable to be developed as attractive tourism resources.

However, the past few decades have evidenced overexploitation of the rich natural resources and environment in various economic activities, without reasonable effort to properly conserve and rehabilitate them. Valuable natural resource and environment have deteriorated at the rate never seen before in history, causing depletion of biodiversity, devastation of life supporting system, deterioration of water quality, depletion of fishery resource, shortage of fresh water in dry seasons, social conflicts in water and other resource uses. All these degenerate quality of life, reflecting that the development path was, has been and is unsustainable. (Ratanachai and Sutiwipakorn, 2006)

Master Plan Development Process

Given the above situation, the Government thus saw the necessity for maneuvering and guiding the SLB development to stay within a sustainability framework, forming an efficient and effective life supporting system, and consequently lead to better quality of life for SLB inhabitants in a sustainable manner. The Government therefore assigned the Ministry of Natural Resources and Environment to develop a Master Plan for sustainable development of SLB. It was stipulated that the SLB Master Plan (SLBMP) give emphasis on conserving and rehabilitating the SLB natural resource and environment, so that they are restored to the original state as far as practicable.

Figure 1. Songkhla Lake Basin

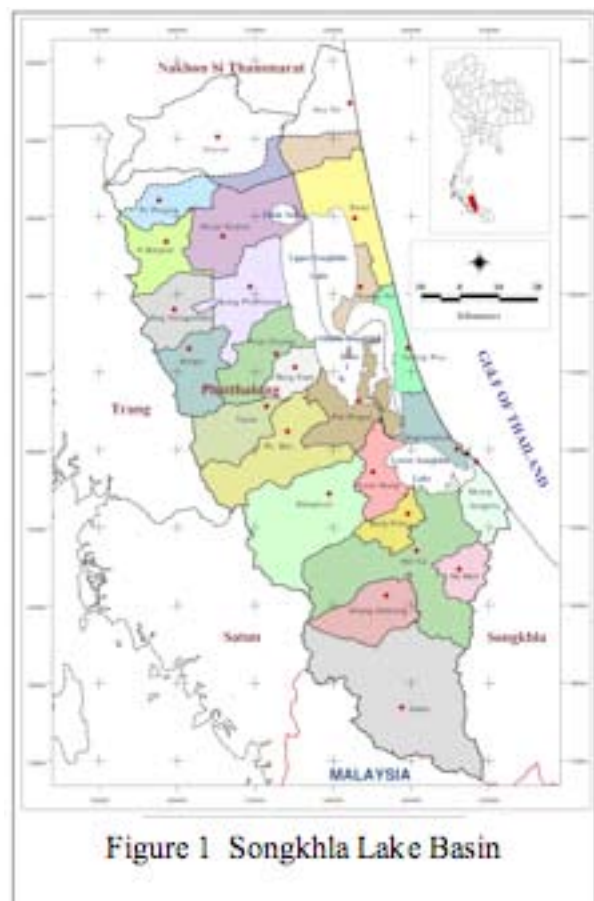


Figure 1 Songkhla Lake Basin

The Ministry of Natural Resources and Environment commissioned a consortium of three universities in the Basin, comprising Prince of Songkla University, Taksin University and Songkhla Rajabhat University, to conduct this study. This is simply because the universities had been and are the institutions that people trust (that they are neutral and impartial). The study team, led by the author, consisted of 15 key researchers and organized in 9 sub-teams: Ecological Resource, Water Resource, Soil and Land Use, Waste Management, Math Modeling, Tourism, Cultural and Historical aspects, Legal and Administrative aspects, Public Participation. The study took 14 months, from December 2003 until January 2005. The total budget of the study was 20 millions Baht (approx. US\$ 0.6 millions).

The development process of SLBMP comprised four essential steps: (1) Identifying present situation (2) Identifying common goal of the basin community (3) Assessing alternatives to see if they are feasible technologically, economically, environmentally and socially, and (4) Synthesizing most appropriate solutions and formulating the strategies and measures.

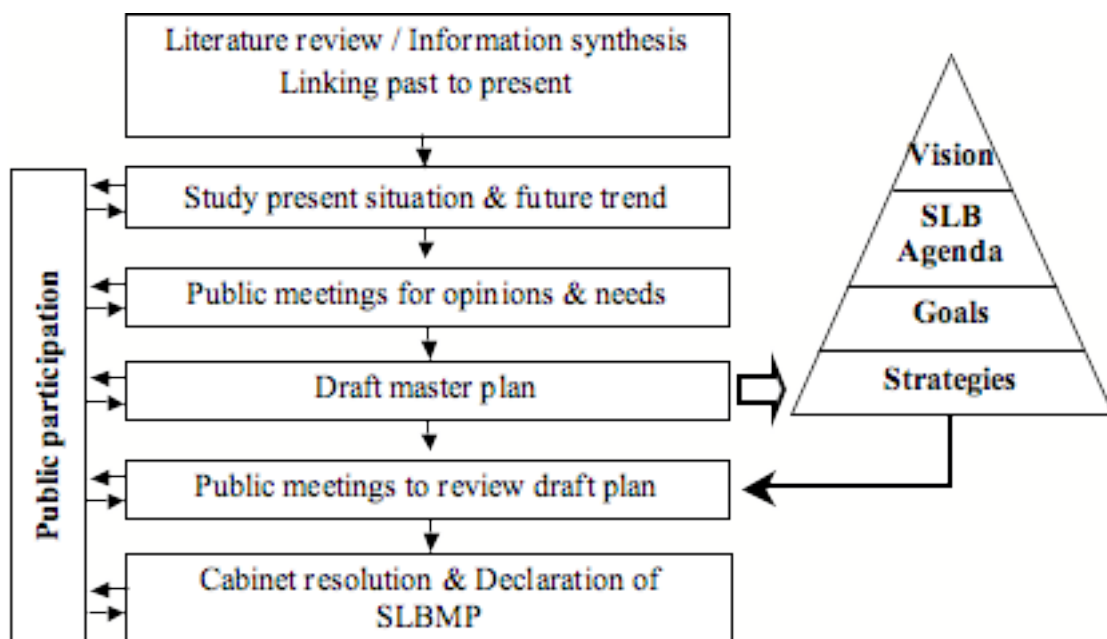
Public participation had been incorporated into the SLBMP development process from the very outset of the study, during the study process, up to the conclusion stage of the study. Twenty-five public meetings were held basin-wide. The first two opening meetings which catered approximately 200 participants each were to voice public opinions on basin problems and issues and their suggestions for corrections and improvements. The study team then brought their concerns into consideration in drafting the first draft of the Master Plan. Needless to say, besides this community-based socio-economic information, the drafting of SLBMP also utilized the most up-to-date scientific data and

information. The draft SLBMP was presented to the following 10 public meetings for their perusal. Each meeting catered approximately 80 - 130 participants. As anticipated, the draft SLBMP received very critical comments and remarks. All comments and remarks were adopted, analyzed and continually integrated into the draft, from one meeting to the next. After this first round of 10 basin-wide meetings, all comments and remarks, as well as additional needs and concerns, were brought into consideration and the SLBMP underwent the major revision.

The second draft of the MP was much different from the first. It supposedly incorporated the basin needs from viewpoint of science as suggested by environmental destruction and social deterioration, as well as needs and concerns of the communities. These alternatives had also been analyzed and screened, and only the most technologically, economically, environmentally and socially feasible were selected. The second round of 10 basin-wide meetings were then held to discuss the second draft of the MP. Each meeting also catered approximately 100 participants. The comments and remarks were remarkably less critical, but more focused on some specific issues. They were again adopted, analyzed, and continually integrated into the draft, from one meeting to the next. After this second round of basin-wide meetings, all comments and remarks were brought into consideration and the MP went through another major revision. As expected, the revision was more of the fine-tuning rather than rigorous change of the strategies.

In all meetings, only 30-40 participants were invited in writing (by the study team). They were relevant central (from Bangkok) and local government officials, selected private sectors and NGOs. In addition, open invitation was made to other stakeholders and general public by posters

Figure 2 SLB Master Plan Development Process



(posted one week in advance) and simple announcement using a pick-up truck (with loud speakers) running around the proximity of the area where the meeting was held (on the day prior to the meeting and on the meeting day). The meetings were held during weekends in public places such as municipalities' halls, schools, temples, and were open to everyone. The audiences in meetings ranged between 80-130. Understandably, most people could not spare time, and were busy doing other things. Fortunately, there seemed to be self-controlled mechanisms to prevent undesirable organized groups which could have dominated the meetings (which the study team did worry in the first place).

Strongest voices seemed to have come from farmers who contended that they did not receive enough water for irrigation, fishermen who felt the depletion of fish resources, and lay people who felt pollution from factories. No specific tactics were devised to handle these people. Some simple questions were clarified in the meetings (by relevant participants), others issues which needed correction were incorporated into the Master Plan.

Two following meetings were held to present to the public what have been revised, and regarded as the final version of the MP; and finally, the closing meeting was held to conclude the MP development process. The last three meetings catered approximately 250 participants each. It should be noted that, apart from these 25 formal meetings, there were tens of other focal group meetings held informally. Most of them focused on specific interest group, such as fishermen, business people, government personnel, etc. (Fig. 2)

SLB Problems & Issues

The Songkhla Lake Basin has in the past undergone rapid social and economic development. Such a process has exploited, and before long, depleted and deteriorated the once abundant natural resources. The conflicting issue of utilization vs. conservation of natural resources and environment has become more and more critical, and often-times developed into serious social conflicts. Summary of SLB problems and issues are:

- (1) **Steady decline of upstream forest:** Year 2002 saw only 1,164 sq.km., equivalent to 13.7% of SLB area, of the forest in the upstream area, as compared with 1,559 sq.km. (18.4% of SLB area) in 1993.
- (2) **Steady decline of mangrove and peat swamp forest:** Year 2004 saw only 150 sq.km., equivalent to 1.75% of SLB area, of mangrove and swamp forest.
- (3) **Soil erosion and sedimentation in waterways and Lake:** Large portion of SLB area has been facing erosion problem. Approximately 2,880 sq.km, equivalent to 27.3% of SLB area, has an erosion rate exceeding 12.5 tons/hectare/year. Out of this, over 0.7 millions
- rais has an erosion rate exceeding 94 tons/hectare/year, which is considered very severe.
- (4) **Loss of rare and vulnerable wildlife species:** Due to deterioration of various environmental conditions, several rare and vulnerable wildlife species are declining in number and may disappear, if no appropriate conservation measures are provided.
- (5) **Lack of integrated water management:** Water demand for domestic consumption, industrial uses, irrigation uses, as well as ecological systems, gradually increase. There is thus an urgent need for establishing an effective mechanism for integrated water resource management.
- (6) **Freshwater over-pumping / saline intrusion:** An average of 58 Million cubic meters of freshwater per year is extracted from Songkhla Lake for irrigating paddy rice farms in northeastern part of SLB. In the dry season, salinity intrudes as far as the northernmost part of Upper Songkhla Lake.
- (7) **Groundwater overuse:** Safe yield of groundwater extracted from the Hat Yai Basin has been estimated at approx. 35 Million cubic meters per year, or approx. 96,000 cubic meters per day; while in Year 2004, 75,600 cubic meters per day of groundwater has been extracted from Hat Yai Basin, which is considered critical. Furthermore, data in Year 2002 suggests that area whose groundwater level is more than 8 m. has expanded to cover approximately 103 sq.km., and expanding. This will affect the groundwater basin: it will induce salinity intrusion to the point that the Basin become unusable.
- (8) **More severe flooding:** Flood regimes in SLB differ in different parts of the Basin. In upstream and mid-stream zone, flash flooding is usually associated with heavy rain and overland flow; whereas in downstream zone, inundation is usually caused by either prolonged impounding in lowland area or overflow from waterways.
- (9) **Over-capacity fishing:** Fisheries in Songkhla Lake and Phru Kuan Kreng (Wetland north of Songkhla Lake) have recently undergone massive changes. Innovative and more efficient methods and fishing gears have been introduced. Many of those employed are destructive, leading to drastic deterioration and decline of aquatic fauna resources.
- (10) **Insufficient wastewater treatment facilities:** There are only two central wastewater treatment plants in SLB: one in Hat Yai City Municipality, another in Songkha City Municipality. The service area, however, does not cover the total area of both municipalities. Only

about 7% of the Basin population are currently being serviced by the existing facilities.

- (11) **Wastewater pollution problems:** Major wastewater pollution sources comprise (i) domestic wastewater sources which discharges approx. 100,000 cubic meters per day, containing approx. 17,000 kg BOD per day, most of which is generated from large communities, especially Hat Yai and Songkhla; (ii) industrial wastewater sources most of which lie along main highways, having total BOD of approx. 3,000 kg per day; (iii) wastewater from swine farms which has total BOD of approx. 1,200 kg per day; and (iv) wastewater from shrimp farms which widely fluctuate, and has total BOD in the range of 13,600-19,000 kg per day. Apart from simple organic waste (BOD), this wastewater also discharges nutrients, which contribute to the eutrophication problem.
- (12) **Unsanitized solid waste management:** Solid waste in SLB is typically disposed of by landfill. Sanitary landfill is found only in large municipalities, such as Hat Yai and Songkhla. Solid wastes elsewhere are disposed of by simple (unsanitized) landfill, or open dumping.
- (13) **Deterioration of water quality in waterways and lake:** Major wastewater sources are (i) domestic wastewater sources; (ii) industrial wastewater sources; (iii) wastewater from swine farms; and (iv) wastewater from shrimp farms. All these contribute to the pollution problems in waterways and Songkhla Lake.
- (14) **Culture and local wisdom disregarded; historical / archeological sites deteriorated:** This is because no policy has been formulated to enhance public awareness to understand values of these resources.
- (15) **Lack of network of culture and historical / archeological sites and local wisdom:** Networks existed in forms of associations, clubs, foundations occasionally coordinate in joint missions, but hardly in a sustained and continuous basis. Such loose coordination does not lend itself to long lasting relationships, empowerment, exchange of information, knowledge and experiences, all of which are necessary in inheriting process of learning and development of culture & historical / archeological sites and local wisdom
- (16) **Lack of sustainable tourism promotion:** SLB is a home to a great number of invaluable tourism resources, but lack sufficient analyses and syntheses to assess their potentials and carrying capacities. Some of these problems include concentration of income and benefits to selected groups, lack of coordination and cooperation between government agencies and local communities.
- (17) **Lack of effective management:** Given centralization-style management which emphasizes individual

ministerial and departmental missions, no organizations or agencies have been assigned direct responsibility for SLB development. Most decisions are still made by centralized agencies. There is thus an urgent need to establish the organization which is responsible for SLB management, and which will provide venue for full public participation.

Strategies for SLB Development

Through a series of meetings as well as study team's analysis, the vision of SLB people could be summed up as: *Songkhla Lake Basin shall be restored and managed along a sustainability framework, keeping balance among ecological, economic and social systems; under institutional framework which pays high respect to public participation, efficiency, transparency and justice.*

It is imperative that SLB development in the next decade place emphasis on the 5 strategies and 26 measures are proposed, as follows:

Strategy 1: Rehabilitation of SLB natural resource and biodiversity, consisting of 5 measures

- 1) Restoration of, and thereafter nourishing, forest in upstream part of the Basin;
- 2) Restoration of, and thereafter nourishing, mangrove forest and peat swamp forest along coastline of the Lake, and around islands within the Lake;
- 3) Provision of public land for inhabitants who may be displaced following the above measures;
- 4) Dredging the Lake where appropriate, e.g., where siltation is severe, or where it is anticipated that dredging can restore abundance of aquatic fauna; and
- 5) Restoration of rare and vulnerable aquatic fauna.

Strategy 2: Sustainable use of SLB natural resources, consisting of 6 measures

- 1) Management of soil resource and land use in SLB, in line with their natural potentials;
- 2) Management of surface water and groundwater, in an integrated manner, both for consumption and other economic activities;
- 3) Controlling the amount of freshwater pumped from the Lake during dry seasons;
- 4) Management of water resource with emphasis on public participation;

- 5) Improvement of drainage system and mass transportation system; and
- 6) Sustainable management of fishery and aquaculture activities.

Strategy 3: Pollution prevention and control, consisting of 6 measures

- 1) Reduction of discharged nutrients, from domestic waste, industrial waste, swine farms and aquaculture activities, into the Lake;
- 2) Installation of appropriate waste treatment systems for municipalities;
- 3) Campaign for environmental awareness in pollution problems;
- 4) Establishment of efficient and effective management scheme for solid wastes, with careful consideration on economic, social and political feasibility;
- 5) Controlling land use and pollution source; and
- 6) Improvement of environmental quality for communities along selected waterways, allowing sufficient participation from stakeholders.

Strategy 4: Restoration and conservation of arts and culture, historical and archeological sites, tourism sites and local wisdom, consisting of 4 measures

- 1) Restoration and conservation of arts and culture, tradition and local wisdom;
- 2) Restoration and conservation and utilization of historical and archeological sites, and tourism sites;
- 3) Development of network for learning and exchanging information about arts and culture, historical and archeological sites and local wisdom; and
- 4) Promotion of sustainable tourism, in line with potentials of the sites, with careful consideration on communities' benefits.

Strategy 5: Enhancement of efficiency in SLB administration and management, with emphasis on public participation, consisting of 5 measures

- 1) Improvement of mechanism for administration and management of SLB natural resource and environment, so as to drive execution of the Master Plan;
- 2) Enhancement of public participation;

- 3) Establishment of mechanism for improving work culture;
- 4) Establishment of mechanism where SLB database can be continually improved and updated, while maintaining its integrity; and
- 5) Establishment of a surveillance process where SLB development can be continuously and effectively monitored and evaluated.

Proposed Project Ideas under the above Strategies

In order to launch the SLB Development Master Plan into implementation, the above study had proposed a number of project ideas following the aforementioned strategies. The project ideas are the outcomes from public consultation process (discussed above) involving all sectors of the public. At the completion of this planning study, 57 project ideas were developed.

Besides adhering to the strategies and measures, the proposed project ideas were developed to meet public demands. They were intended primarily to serve as starting points which could facilitate and expedite development of project details. It should however be noted that these project ideas represented only examples of a much more plausible projects under this Master Plan, and by no means were exhaustive. Given that this Master Plan is meant to be dynamic and rolling, responsible agencies will have to adjust them according to the actual tasks, when more information becomes available.

Stakeholders Involvement

As earlier mentioned, public participation had been incorporated into the SLBMP development process from the very outset of the study, during the study process, up to the conclusion stage of the study. The role, contribution and consequences of various stakeholders in this planning process were as follows:

- (1) **Public (government) sector:** Traditionally, the process of planning, implementing and overseeing the public activities in this country had been responsibility of the public sector with very little, if any, public involvement. They are therefore the most knowledgeable and rich in information. Their involvement is therefore necessary. In this planning study, the involvement of the public sector has been satisfactory. Various departments in the Ministry of Natural Resources and Environment, the core public sector, has been very instrumental in the planning process: they joined all public meetings, served as resource persons, provided a lot of useful information and coordinated other government agencies. Collaboration received from other government agencies varied. At the minimum, all were cooperative

in providing the study team with whatever information requested. At the completion of the plan, all the government agencies willingly adopted the SLBMP as their guiding plan for their respective agencies' action plans, even prior to Cabinet resolution.

- (2) **Private sector:** Most important private sectors in this study included industries and tourism business. Their involvement would certainly help in identifying constraints, if any, in complying with the regulation. Very few attended the public meetings, possibly due to time availability. The study team therefore held a few focus group meetings with factory owners / administrators, hotel executives and businesspersons. Oftentimes, the issues were redefined to make them more attractive to cooperate, such as discussing about clean technology rather than simple pollution control. The meetings revealed information about constraints in complying with the regulations, and alternative means for combating pollution.
- (3) **Academics:** They are trustworthy and respected by the public. Their involvement was very important. In fact, this was the very reason why the three universities in the area were selected as the study team. Besides the study team, other independent academics have made good deal of contributions. Their opinions were decisive and informative. Though a great number of studies on various SLB issues have been conducted, the results were not conclusive. A good deal of educated judgments were necessary. Ratanachai and Sutiwipakorn (2006) concluded that the amount of scientific knowledge in SLB is sufficient for planning purposes, but more research is needed in order to fine-tune the plans and to recommend alternative measures.
- (4) **Local governments:** New Thai constitutions and other laws stipulated that local governments have both authority and responsibility to look after their environment and natural resources. Their involvement in this planning process was therefore a must. Different levels of participations were observed. In general, the more "rural" the areas were, the more active the participations were. The term "basin development" may sound a little "remote" for urban local governments who would be more interested in issues closer to them such as solid wastes and traffic problems. Besides, the rural local government seems to be the only organization that looks after the "quality of life" of the people while there are a few other organizations (representatives of national level government organizations) do so in the urban areas. Very active participations were also observed in the areas where there were serious environmental and social problems, such as the areas where there were pollution problems from swine farms or forest encroachment.
- (5) **Media:** Notable were the contribution made by community radios which had become commonplace in Thailand. Not only did they help persuading people to come to the public meetings, but they also play important role in building environmental awareness. Though their missions were independent from the planning study, the outcomes were useful in helping people understand the environmental problems and issues.
- (6) **Interest (Occupation) groups:** Most notable was the fishermen group. The record in 1995 indicated that there were a little more than 8,000 households, residing in 158 villages. While their ways-of-life depend very much on lake water quality, the huge number of fishing gears deployed in Songkhla Lake also are believed to cause problems. The fishermen group nonetheless form a strong interest group. Their participation was so important that special mission was separately organized. Thirty-eight focus group meetings catering over 2,000 fishermen were held.
- (7) **NGO:** There are several capable NGOs working in SLB. There are NGOs which look after upstream forest, mid-stream forest, downstream forest, fishery, among other things. Some are well connected both formally and informally. Their participations were helpful.
- (8) **General public / community / people:** While the participation of lay people are very crucial part of the planning process, it was encouraging that all 25 public meetings basin-wide were very well received by general public. The discussion and debate were critical and constructive. Several conflicts were brought into the meetings. Some conflicts were resolved within single meetings, others took several meetings and a great deal of information and scientific reasoning, not to mention heating debates. In most parts of SLB, there seemed to be several respectable natural leaders well established, who can act as mediators.

Level of Participation

Though public participation a new phenomenon in this country, it has been strongly endorsed by Thai constitution. Public participation was stipulated in both 1997 and 2007 constitutions, which prompt new paradigm of thinking and working culture of public agencies nation-wide. The level of participation varied in different meetings. In early meetings, participants were asked to voice their opinions, make recommendation and suggest alternative solutions. At the later meetings, they were asked to approve the draft MP. This can approximately be equated to "Level 5 - Partnership" of Arnstein's Ladder of Participation (Arnstein, 1969). This is satisfactory for planning process of the Master plan, given that there need to be some compromising among several stakeholders, thus decision cannot be left to any single parties. The planning study team was very careful when giving information to the public. The

information given must be non-bias scientific information, with little or no subjective judgment.

Collective Responsibility

The study team had repeatedly emphasized (to the participants in the meetings) that the quality of SLBMP is very much based on the available information. The MP implementation should be regarded as dynamic and rolling. It should be updated periodically when more information are available. One benefit of strong stakeholder involvement is that the general public has a strong sense of ownership towards the SLBMP. They are responsible to face the risk of unpredictable outcome, and ready to update and adjust the plan when necessary. By the same token, the government agencies involved were willing to adopt the SLBMP as their guiding plan for their respective agencies' action plans, having understood that it reflected the real need of the people in the Basin, let alone supported by strong technical analysis.

It should also be noted that, apart from incorrect information and unpredictable uncertainty, public needs and goals do change with time, especially when quality of life has improved. Values given to social and environmental quality are expected to change when public wealth increases. This may at times prompt the need for changes in priorities and alternatives.

Ways for improvement

The above procedure proved to be an acceptable model for developing the master plan. Extensive public meetings ensured that all public wants and concerns were taken into consideration. Involvement of various stakeholders ensured that the outcome be acceptable by all parties, thus pose no problem during implementation. It is anticipated that appropriate task team be appointed to oversee, and assess the outcome of, its implementation.

There are however many possibilities the SLBMP planning process could be improved. Firstly, the level of public participation should be enhanced. Public should be encouraged to get actively involved in the implementation phase, which includes monitoring and evaluation, of the SLBMP. This will gradually equip public with better information and analytical tools. After the public become so well equipped, a mechanism should be so designed that public update the SLBMP themselves, while having government technocrats and academics serving as their assistants. Secondly, the SLBMP should provide a mechanism for self-supporting selected priority alternatives, so that there are no budgeting problem. Innovative taxation and other economic tools should be devised such that a good portion of selected benefits go to local rather than the central government. Thirdly, the government must make decentralization of authority a reality. The implementation of an area-based development such as this need very effective integration of tasks and cannot be successful if mission objectives are departmentalized. Finally, to resolve several issues systematically and holistically, at the end of the day, the Songkhla Lake Authority (SLA) should be established. Meanwhile, a study should be conducted to identify most appropriate modality and possible risks and precaution which should be taken; preparation should then proceed accordingly.

References

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