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## **COOPERATION IN FISHERIES AMONG THE BIMST-EC COUNTRIES**

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### **Abstract**

BIMST-EC countries are situated bordering the Bay of Bengal—a large marine ecosystem. Located in the monsoon belt, this region is bordered by five countries - Bangladesh, India, Myanmar, Sri Lanka and Thailand. All are developing countries in the Asian region and, among them, India and Thailand are strong in technologies in the fisheries sector when compared to the other three countries. The coastal and offshore waters of the region support numerous fisheries, which are of great socio-economic importance to the countries, and provide for direct employment to around two million fishermen. Among the most important of these are the inshore small pelagics, demersal and shrimp fisheries. During the last decade, fish landings of the BIMST-EC region have increased mostly due to the increase in fishing effort. Catch Per Unit Effort (CPUE) has gone down in many commercially important fisheries.

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Many of the fishery resources of the BIMST-EC area have been heavily exploited due to unregulated and unmanaged fishing practices. This is further complicated by poor national resources management practices, unaddressed transboundary environmental and fisheries issues combined with the open access nature of fisheries. Inland fisheries and aquaculture are also important sectors where river, tributaries, floodplains, lakes, swamps, reservoirs and ponds are an integral part of protein supply to most rural communities of the BIMST-EC region. Cooperation in fisheries among BIMST-EC countries is essential to manage specially the coastal and nearshore resources in a co-ordinated and integrated manner.

### **General Information**

Under the BIMST-EC framework, Fisheries is identified as a potential area for BIMST to work together through technical and economic cooperation. To the region's population, fish is important as a source of nutrition, employment, and income. For its Governments, the fisheries sector is vital for national food security, for foreign exchange earnings, and as a means to address the problem of poverty. The importance of fisheries sector is even more pronounced for Sri Lanka -- the only island nation among BIMST-EC countries.

To be more precise, some of 11.4 million MT of fish, which accounted for 10% of the world fish production (approximately 117 million MT), is produced from BIMST-EC countries. In term of foreign exchange earnings, BIMST-EC countries generate over US \$ 4.4 billion in net income from fisheries trade.

In addition to the role of fish as a food commodity, it is an input for other useful ends such as for ornamental purposes, for recreation, and for conservation. In addition to food and food additives, fisheries yield products that are used in animal

and crop feeds, cosmetics, detergents, jewelery, and a wide range of industrial and pharmaceutical products.

The 2<sup>nd</sup> BIMST-EC Ministerial meeting, held in Dhaka, Bangladesh, agreed to foster cooperation in fisheries among BIMST-EC countries to **develop common interests in the field of fisheries and fisheries related industries** for the mutual benefit of BIMSTEC members, to provide a forum for consultation in the area of fisheries cooperation, and to cope with global, regional and sub-regional fisheries emerging issues. The sectoral committee on fisheries has identified five key areas that need cooperation. They are:

- (i). Fisheries research and development;
- (ii). Promotion of technical cooperation in fisheries;
- (iii). Promotion of investment including joint ventures for fishing, processing, quality control and marketing of fish and fishery products;
- (iv). Promotion of trade in fish and fishery products; and
- (v). Other areas of mutual interest.

It is estimated that about 50 million people from different parts of the world rely on small-scale fisheries, through catching, processing, trading or marketing for their livelihood, of which roughly around 15-20% is from BIMST-EC countries.

Fish culture in rice fields has been in practice for hundreds of years in the Asian region and is well developed in some Asian countries. Various types of rice fish farming systems such as rearing of fry and fingerlings, and production of marketable size fish are practiced in India, Bangladesh and Myanmar.



Degrading valuable mangrove ecosystems due to shrimp farming is a problem in several countries of the BIMST-EC region. While the few rich farmers can afford to use the intensive systems to produce shrimp in mass, the poor small scale fishermen/farmers that only need to sell their small crops to keep themselves alive are the ones who really suffer due to mangrove destruction. This is a common problem among Asian countries.

It was noted that though all nations, big and small, have been given exclusive rights for exploration and exploitation of resources in the EEZ, there is inadequate knowledge in many of the BIMST-EC countries about the living resources available and resources situation in their Exclusive Economic Zones. The human resources, money and technical know-how necessary for attaining such knowledge are also inadequate.

Mariculture for finfish and edible oysters, mud crabs, etc., actively practised in the ASEAN countries, is still in its infancy in some of the BIMST-EC countries. The situation is similar in the case of ornamental fish culture too.

Sometimes, human resources and technical know-how are available but funding is the major constraint. Among BIMST-EC countries, only Thailand can be considered as a large-scale fish importer and exporter. India enters into the fish trade as a big exporter. Most fishers of BIMST-EC countries are engaged in artisanal fisheries using unsophisticated technology. Wide spread poverty among artisanal fishers, overfished resources and increasing degradation of fishing grounds make the fisheries subsector a key area for financial support from outside donors.

The widespread poverty in artisanal fishing communities contributes to resource degradation; hence poverty reduction should

be a priority concern. However, the problem of poverty cannot be addressed effectively within the fisheries sector or within a broader national economy.

## **Bangladesh**

The concurrent culture of rice and fish is being promoted in Bangladesh and there is growing interest in low-cost methods for improving yields, as Bangladesh's strategy is to improve traditional farming techniques rather than going for intensive aquaculture practices.

The freshwater river systems and floodplains of Bangladesh are the breeding grounds for nearly 13 endemic species of carps and barb and a large number of other fish species, including a number of exotic carps and other species that have been introduced for aquaculture since 1969. Breeding of endemic and exotic aquaculture species for seed production through hypophysation technique has been a common practice in Bangladesh. Over 700 hatcheries, established in private and public sectors, have been breeding endemic and exotic fish species. This technologies may be useful for other developing countries for fresh water aquaculture promotion. Training courses on sustainable aquaculture, particularly Integrated Aquaculture conducted in Bangladesh, may be of use to the other BIMST-EC members.

The Government of Bangladesh is interested in better managing the ESN fishing all along the coast of southern Bangladesh. ESN fishing, which is a destructive fishing method, interacts with other fishing methods, such as push nets, beach seines, trammel nets, marine SBN and marine trawl fishery.

This traditional fishery, which provides livelihood to a large population, most of them below poverty level, has to be well-managed, and expertise is available within BIMST-EC member countries.

In Bangladesh, people are more accustomed to fresh water than marine fish and the marine capture fishery, especially shrimp, concentrates on the export market. Marine fisheries accounts for around 30% of total landings. And there is potential to develop off-shore and deep sea fisheries for which expertise is available within BIMST-EC countries.

Fisheries in Bangladesh, in particular marine and brackish-water fisheries, are faced with a dilemma. On the one hand, fisheries provide the people of Bangladesh with protein at a reasonable price and generates employment, income and foreign exchange. On the other hand, fisheries--particularly the in-shore marine and estuarine fisheries -- are under stress due to over fishing, environmental and habitat degradation.

The Government of Bangladesh has committed itself to preserving and conserving the aquatic resources of the country and the related environments, while seeking sustainable ways of exploiting the resources to benefit the population. To this end, the government has drawn up a Perspective Development Plan for the period 1995 - 2010 to give direction to, *inter alia*, the fisheries sector and its development. Sustainable management of aquatic resources and the management mechanisms necessary to achieve it form an important part of the plan.

The Government of Bangladesh is addressing these issues through a strategy that includes: (i) conserving aquatic resources; (ii) shifting priorities in management from revenue-generation to



biological production and sustainability; (iii) increasing production by involving resource-users in management and enhancement; and (iv) rehabilitation of degraded habitats.

There are about 147,000 ha of ponds in Bangladesh, of which only 60% are cultured and 40% are underutilized. Considerable potential exists to increase production through better utilization and management of these resources, but the sub-sector still faces problems. Many people, particularly the poor, do not have access to appropriate technology or skills, because of weak extension. This is an area where other BIMST-EC member countries can provide their expertise to resolve this issue.

Key elements in the government's strategy for the aquaculture are: increasing the scale and scope of training for farmers to increase technical knowledge and skills; the encouragement of group utilization of pond resources, and the rehabilitation of publicly-owned ponds. Among BIMST-EC countries, India and Thailand are strong in this area and can help Bangladesh by providing technical knowhow.

Rapid development of shrimp farming in the extensive coastal and brackish water areas of Bangladesh has made a very significant contribution to the growth of national export earnings, and shrimp farming is now an important element in both the local and national economies. However, the expansion of shrimp farming has raised important issues regarding land and water use in coastal areas. Sufficient experience and expertise is available in India, Thailand and Sri Lanka on this issue and can cooperate with Bangladesh.

The Government of Bangladesh strategy concerning shrimp farming includes promotion of improved traditional rather than

intensive, shrimp farming; group formation; and extension services on how to deal with shrimp disease outbreaks. As this is a subject of common interest to all BIMST-EC countries they can share their knowledge through exchange of scientists.

The lion's share of fish supply in Bangladesh used to come from open-water inland fisheries. Due to over fishing, indiscriminate use of insecticides and pesticides, the building of flood control dams, siltation of rivers and other open water bodies, pollution by industrial effluents, lack of effective conservation policies and capture of brood stock as well as juveniles, open-water inland fish production has decreased dramatically. Its contribution to total fish production dropped from 80% in earlier days to 60% in 1984/85 and 50% in 1993/94. As this situation is still continuing, industrial marine trawling may offer further opportunities for foreign exchange earnings, but the carrying capacity of aquatic resources in the Bay of Bengal are is still unknown. Other BIMST-EC member countries can cooperate with Bangladesh Government in (i) stock assessment, and (ii) providing technical know-how for harvesting off-shore and deep sea stocks.

## **India**

There are nearly 6 million fishermen in India, of which 2.4 million are fulltime, 0.45 million part time and the rest are occasional. They use wide range of fishing gear including seines, stake nets, lines, bag nets, encircling nets and lift nets.

Role of women in various activities in fish farming such as broodstock and seed collection, pond maintenance, collection and preparation of feeds and even in pond harvesting is very high in India. Although woman in India are not conspicuous in



the formal industrial sector, their role in traditional coastal shrimp farming is quite significant. The rapid development of this industry has provided employment opportunities for women as an example to other BIMST-EC countries who are keen in developing coastal traditional shrimp farming.

Brackishwater shrimp (*Penaeus monodon*) and freshwater prawn (*Macrobrachium rosenbergii*) culture is receiving much attention in India, as in many other Asian countries because of the export potential. India is practising traditional as well as semi-intensive culture techniques. Success stories as well as chaotic situations due to hasty decision on setting up shrimp firms can be observed from India. This information and experience may be of much importance to the other developing countries. Facing disease situations in shrimp aquaculture is a major issue and the Indian experience in this subject is immense.

Selective breeding for growth improvement, evaluation of brood fish size on growth performance of progeny, characterization of improvement stocks using RADP analysis, characterization of improved wild and hatchery stocks, conservation and documentation of major carps, endangered and economically important species, construction of genomic and C-DNA libraries of Indian carps and cat fish, development of genetic markers for hatchery brood stocks of Indian major carps are important areas where India is strong in aquaculture sub-sector.

Some of the fishery issues faced by the Government of India are:

1. Trawl fishery management;
2. Managing the rapid development of coastal aquaculture of *P. monodon*;

3. Problems of by catch discards of the trawl fishery;
4. Implementing gear modifications to reduce catching juveniles;
5. Promoting gear diversification of trawlers; and
6. Developing economical means of by catch utilization.

India's future fisheries development plans are aimed at increasing fish production, improving the welfare of fishers, promoting exports and providing food security. The per capita availability and consumption of fish is to be increased to a level of 11 kg per annum for the fish eating population and production has to be increased proportionately.

India's marine fisheries production has reached a plateau and, at best, only marginal increase is predicted in the near future. Most major stocks are fully exploited and further increase has to come from exploitation of deep-sea resources. However, inland production has shown a rapid growth, recording an annual growth rate of 6%. Aquaculture is the principal factor in this development. According to the available information, most of the future additional demand for fish will have to be met from aquaculture.

## **Myanmar**

Myanmar, in Southeast Asia, has a land area of 676.577 km<sup>2</sup> and a population of approximately 50 million in 2001 – 2002. The fisheries sector plays an important role in contributing to the social and economic development of Myanmar where the people are consumers of rice and fish.

Fifty percent of the catch is consumed in cured, dried, salted, fermented, paste and sauce form; 35% is consumed fresh; 12% is

used for miscellaneous purposes and only 3% is exported. Export promotion is an area where the other BIMST- EC countries can share their expertise.

Over the last several years, the average annual production of marine fishery has been growing steadily but the reason for the low productivity is attributed to the use of traditional fishing methods. Thailand and India can provide their knowledge to Myanmar on advanced fishing technologies and to improve harvesting levels of offshore and deepsea stocks.

The pressure on inland fishery resources is fairly high due to local demand and high prices compared to marine fish. Deep-sea demersal stocks of about 9,000 mt has been recorded off the Tanintharyi coast. One quarter of this stock is deep-sea lobsters (*Puerulus sewelli*). This is an area where Myanmar needs technical cooperation on harvesting deep sea stocks on a sustainable basis.

According to available information, aquaculture in Myanmar has scope for further expansion. At present, culture activities are mostly confined to freshwater species. Locally preferred species, such as the common catfish (*Clarias batrachus*) and snake heads (*Ophiolcephalus striatus*), are in the trail stages of culture and in need of great improvement. BIMST-EC countries have required technologies for promoting aquaculture/ Mari culture.

Seed production and grow-out culture of giant tiger shrimp (*Penaeus monodon*) have been carried out but the results have not been satisfactory. This technology is well developed in India and Thailand which they can share with Myanmar.



## Sri Lanka

Marine fisheries is the mainstay of fish production in Sri Lanka. Tuna long line fishing is another area where Sri Lankan Government is planning to expand during the next few years. Tuna fishing, which is now mostly done by gill nets, is gradually changing to long lining. An estimated 1700 multi-day boats lands over 50000 tons of fish of the Tuna group each year and of which more than 90% is locally consumed mainly because they are not in good exportable quality. The Government has given very high priority for research on improving the quality of the catch of multi-day boats.

The Government is also interested in improving the ornamental fish export trade where the BIMST-EC member countries can establish trade linkages with the Sri Lankan Government. Sri Lanka is the only country in the BIMST-EC region that is a large supplier of marine ornamental fish to the European Union (Source: Tomy, 1996). Sri Lanka has required technology for breeding freshwater fish in captivity but is seeking external assistance to promote breeding of marine ornamental fish species.

The resources available for the development of inland fisheries and aquaculture constitute 260,000 ha of freshwater bodies. In recent years, there has been a steady growth of fish production in the inland fisheries sector and several exotic food fish species from India and China have been introduced.

The fishing fleet consists of about 26,600 fishing vessels, of which about 13,000 (48%) are motorized. The majority of the vessels are traditional dug out canoes and log crafts. These are owned by individual fishermen and Fishermen's Cooperative Societies. Offshore and deep sea resources are exploited by 32-50 feet long vessels, powered by inboard diesel engines (popularly known as multiday boats).

Production from multiday boats accounted for about 28% (57,000 mt) of the total marine fish production in 1996. In the same year, the remainder of the motorized fleet, about 11,800 boats, operating in coastal waters, produced about 149,000 mt. of fish.

Except for small quantities of high value species such as shrimp, lobster and tuna, all fish landed is marketed locally. The bulk of the landings is sold fresh with an increasing use of ice.

Export earnings in the fisheries sector have shown a steady growth during the past few years, although the contribution of this sector to the external trade still remains around 2%. Sri Lanka exports mainly shrimps, lobsters, crabs, beche-de-mer, shark fins and frozen fish. Live lobster export industry is an area where other BIMST-EC countries can enter into joint ventures with the Sri Lankan Government.

Deep sea lobster stocks were located in some areas at a depth of 200-400 m. This resource is not harvested by Sri Lankan fishermen due to lack of appropriate technology. Interested BIMST-EC countries can enter into joint ventures with the Sri Lankan Government for the harvesting of this untapped valuable resource.

Shrimp is the major export commodity. It accounts for nearly 40% of total export earnings. About 60% of the shrimp production comes from aquaculture and the balance from capture fisheries. Shrimp culture is expanding steadily. This industry is now threatened by viral problems and prawn farming industry is declining over the past 3-4 years.

The government's fisheries development programme is aiming at the following objectives:

- 1). Increase per capita availability of good quality fish - through Aquaculture promotion and deep sea fishing;
- 2). Increase employment opportunities in the fisheries sector - through Aquaculture promotion and deep sea fishing;
- 3). Promote exports - through Aquaculture promotion and deep sea fishing;
- 4). Conserve and manage the environment and fish resources; and
- 5). Increase women's participation in the fishing industries - mainly through Aquaculture promotion.

## **Thailand**

The rapid development of the fisheries industry in Thailand over the last few decades has resulted in several problems, including stressed pelagic and demersal stocks, deterioration of fisheries resources and their habitats, conflicts between fisher folk, between various gear and between capture and culture fisheries and environmental degradation of fisheries habitats due to waste discharges from aquaculture, industry and tourism.

Selective breeding of common carp for growth improvement, genetic characterization of population of tiger shrimp, banana shrimp, oyster, freshwater prawn and silver barb; sex control and genetic manipulations of silver barbs, Niletilapia, Snake skin and cat fish are major research areas where considerable amount of experience has been gained in Thailand.

Both physically and economically there is a need in Thailand for aquatic protein, and that need is satisfied with shrimp often grown near mangroves, sometimes degrading valuable ecosystems.

Construction of artificial reefs in Thailand as part of marine conservation and habitat enhancement is a proven technology.



Artificial reefs have been developed in several places in the Gulf of Thailand. In most cases, investigations suggest that artificial reefs are effective in natural resources conservation and habitat reconstruction. Shrimp by-catch utilization percentage is very high in Thailand as by-catch is converted into fish sauce and cured products such as salted, smoked and flavoured fish.

In Thailand, minced fish products, such as fish balls are now commercialized and consumed locally and exported. This technology can be shared by other member countries too.

Thailand's future policies in the fisheries sector are:

- (i). Fisheries development and management in Thai waters to maintain sustainable fisheries in both inland and marine sectors;
- (ii). Fisheries development and management outside Thai waters - promote overseas fisheries through joint ventures;
- (iii). Aquaculture development and management; and
- (iv). Post harvest technology development - improve efficient utilization of catches.

Some of the important measures developed in Thailand that may be important to other BIMST-EC countries are:

- (i). Structuring of artificial reefs for marine fish;
- (ii). Controlling mesh size to reduce by-catch;
- (iii). Strengthening research to improve responsible fishing techniques;
- (iv). Upgrading post-harvest technology to worthily utilize by-catch for human food; and

- (v). Promoting responsible coastal aquaculture by zonation and launching seawater irrigation systems.

Thailand has a team of around 3000 researchers working in different areas of the fisheries sector with ultimate goal of increasing fisheries productivity to produce cost-effective products, to upgrade quality of fishery products, to conserve aquatic habitats, to sustain fisheries resource utilization and to increase fishery product competition. Researchers of the other member countries can share this knowledge if there is a network among the fishery scientists of the BIMST-EC countries.

### **Common issues**

As developing countries of the Asian region, most BIMST-EC countries are facing similar challenges and issues. Major common issues of the fisheries sector are:

- i. **Over fishing** – reduction in CPUE;
- ii. **Post harvest losses** – 20 - 30% of the catch is wasted;
- iii. **Environmental issues** – habitat degradation, pollution;
- iv. **Coral Reef degradation** – loss of habitats;
- v. **Loss of Intertidal Areas.** – loss of habitats;
- vi. **Conflicts between artisanal and large scale fishermsn;**
- vii. **encroachment into the territorial waters of neighboring countries** – conflicts;
- viii. **Open access nature of fisheries** - declining catch rates, frequent conflicts;
- ix. **Loss of wetlands** – loss of habitats;

- x. **Destructive Fishing Methods and Wasteful fishing** – loss of habitats, reduction in CPUE;
- xi. **Negative impacts of Aquaculture** – close down of shrimp farms ;
- xii. **Pollution of coastal waters and Inland water bodies** – loss of habitats;
- xiii. **Widespread poverty in artisanal fishing communities** – Use of destructive fishing methods;
- xiv. **Utilization of shrimp by – catch ;**
- xv. **Lack of reliable fishery statistics** – poor management; and
- xvi. **Poor financial management among the fishing communities** – Poor life style



### Coastal characteristics of BIMST-EC Countries

Country	Coast line (km)	Maritime shelf to 200 m depth (km <sup>2</sup> )	EEZ area (km <sup>2</sup> )	Year of EEZ claimed
Bangladesh	580	54,900	0.077 million	1974
India	8041	452100	2.02 million	1977
Myanmar	2832	229500	0.49 million	1977
Sri Lanka	1600	26800	0.52 million	1977
Thailand	3219	251600	0.086 million	1977

Source : ADB Oct. 1997. The Bank's Policy on Fisheries.

### Comments / Proposals on the Areas of cooperation Among BIMST-EC countries.

No.	Areas of Cooperation	Comments / Proposals	Mode of Help
<b>1.</b>	<b>Fisheries Research and Development</b>		
	• Fisheries promotion in inland water bodies	Bangladesh and India can cooperate with other member countries	Ex
	• Brackish water aquaculture/ shrimp culture.	India and Thailand can cooperate with other member countries	Tr
	• Responsible fishing practices	Thailand, Sri Lanka and India can cooperate with other member countries	Tc
	• Implement gear modifications to reduce catching juveniles	Thailand and India can cooperate with other member countries	Tr Ex
	• Minimize post harvest losses.	Thailand can cooperate with other member countries	Tr Ex
<b>2</b>	<b>Promotion of Technical Cooperation in Fisheries</b>		
		India and Thailand can cooperate with other member countries	Tc Ex
	• Upgrading quality of research	India and Thailand can cooperate with other member countries	Ex
	• Boat building	Sri Lanka and Thailand can cooperate with other member countries	Tc
	• Establishing a good fisheries extension system in Bangladesh	Thailand and India can cooperate with other member countries	Tc Ex
	• Training fishermen on fishing technologies in offshore waters	Thailand can cooperate with other member countries	Tc Tr
	• Development of deep sea fishing in Myanmar	Thailand, Sri Lanka and India can share their experience in deep sea fishing	Tc Tr
	• Breeding of some selected exportable marine species – crabs/lobsters/ornamental fish	Thailand can help Sri Lanka in this issue by providing technical cooperation	Ex Tr
	• Development of the marine industrial fisheries	Thailand and India can cooperate with other member countries	Tc Ex
<b>3.</b>	<b>Promotion of investment including joint-ventures for fishing, processing, quality control and marketing of fish and fishery products.</b>		

	<ul style="list-style-type: none"> <li>Joint ventures in deep sea fishing</li> </ul>	India and Thailand can enter into joint ventures with Sri Lanka Bangladesh and Myanmar.	Tc
	<ul style="list-style-type: none"> <li>Marketing of fish and fishery products</li> </ul>	Thailand can cooperate with other member countries.	Tc
	<ul style="list-style-type: none"> <li>Rational exploitation of export oriented marine resources.</li> </ul>	Sri Lanka, India and Thailand can cooperate with other member countries.	Tc
<b>4.</b>	<b>Promotion of Trade in fish and fishery products.</b>		
	<ul style="list-style-type: none"> <li>Development of the ornamental fish trade in Sri Lanka</li> </ul>	Thailand can help Sri Lanka to develop export market	Tc
	<ul style="list-style-type: none"> <li>Export of fishery products – shark fins, conch shells, etc.</li> </ul>	Thailand can cooperate with member countries	Tc
	<ul style="list-style-type: none"> <li>Export of shrimp, live lobsters, tuna species, crabs, etc.</li> </ul>	Thailand can cooperate with member countries	Tc
<b>5</b>	<b>Other areas of mutual interests</b>		
	<ul style="list-style-type: none"> <li>Delimitation of the continental margins of BIMST-EC countries.</li> </ul>	Member countries have to decide on technical cooperation required	Tc Ex
	<ul style="list-style-type: none"> <li>Expeditious release of fishermen who stray into EEZ of other BIMST-EC member countries.</li> </ul>	Case by case basis this has to be attended for releasing fishermen on mutual understanding	-
	<ul style="list-style-type: none"> <li>Minimize negative impacts of aquaculture / shrimp culture</li> </ul>	Sri Lanka, India and Thailand can share their experience with Bangladesh and Myanmar	Ex
	<ul style="list-style-type: none"> <li>Development of Aquaculture in Myanmar</li> </ul>	India and Bangladesh can share their experience with Myanmar	Ex Tc
	<ul style="list-style-type: none"> <li>Breeding of some selected exportable marine species – Crabs/Lobster/Ornamental fish</li> </ul>	Thailand can help Sri Lanka	Tc/Tr

Ex = Exchange of Scientists

Tr = Training

Tc = Technology Transfer



## Final Remarks

1. **Resources management** – There is a clear need to improve fishery resource management of the BIMST-EC region. Among many member countries there are no clear policies, appropriate strategies and measures for the sustainable management. Available policies are not adequately enforced or defined.
2. **Minimise effects due to pollution** – High concentration of fishing activities in the narrow coastal waters of the Bay of Bengal's continental shelf suggests that rising pollution loads in coastal waters are likely to contribute to increased incidence of fish contamination which may lead to serious health problems. BIMST-EC may have to take this up with the BOBP Large Marine Ecosystem Project for suitable mitigatory actions.
3. **Training** – Vast amount of money that goes to outside countries can be minimized if BIMST-EC countries can train scientists among themselves. India and Thailand can play a leading role on this issue.
4. **Network** – Having a network of fishery scientists among BIMST-EC countries is advisable.

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