

FISHERIES MANAGEMENT STRATEGY FOR PERIYA KALAPUWA

**A PLAN TO ADDRESS THE ISSUES AND THREATS OF
THE BIGGEST LAGOON IN AMPARA DISTRICT**



SEEDA

Fisheries Management Strategy for Periya Kalapuwa

A plan to address the issues and threats of the biggest lagoon in Ampara district

Periya Kalapuwa in Ampara district

A lagoon in transition

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Location of the Periya kalapuwa



PERIYA KALAPUWA OF AMPARA DISTRICT

Periya Kalapuwa is the largest lagoon in Ampara district which falls within the administrative areas of *Alayadivembu* and *Thirukkovil* DS divisions and covers an area of nearly 20 sq km or 2000 ha.

The lagoon is fed by number of small rivers including *Ambalan Oya* and *Pannela Oya* which originates from hilly lower Uva region.

It has two outlets one at *Sinna- Muhathuwaram* and the other at *Periya Muhathuwaram* on either side of the coastal fishing village of *Thambattai*.

The main *Akkaraipattu –Pottuvil* road passes over these two lagoon outlets *Sinna Muhathuwaram* and *Periya Muhathuwaram*. To prevent the closure of the lagoon outlets and for the water to pass through the Road Development Authority had laid several Hume-pipes at the river mouths.

At present there is no sign of exchange of water between the sea and the lagoon. The Hume pipes laid across the road are open but there is no flow of water from the lagoon to the sea or the other way. According to the fishermen fishing at the lagoon mouth, during heavy rainy days when the lagoon gets filled with rain water, the lagoon water passes through the pipes to the sea but at no time sea water enters the lagoon.

The result is brackish water of the lagoon had turned in to fresh water. Today *Periya Kalapuwa* is a fresh water lake without mangrove plants; its mouth is brackish due to seepage of sea water

There are large numbers of full time and part time fishermen, fishing in the lagoon and their number is said to be around 3500. Of whom nearly 1800 are full timers. The majority of the fishermen are from the villages bordering the lagoon. There are also fishermen who come to the lagoon seasonally from villages outside the lagoon area, mostly from *Akkaraipattu* and *Sammanthurai* DS divisions.

PART I

THREATS AND ISSUES OF PERIYA KALAPUWA

(1). Major threats to the lagoon:

The threats are warnings of incoming disaster or undesirables that may happen. In Periya kalapuwa lagoon several such threats were identified needing immediate attention. Most of these are due to direct or indirect human involvements and are happening with or without the knowledge of those involved.

After having number of discussions with those fishing in the lagoon, observations made by the writer and information gathered from various sources especially from officers of divisional secretary's and fisheries of Thirrukkovil and Alayadiwembu regions, several such threats to the lagoon and its fish resources were identified

Majority of the threats identified are common not only to lagoons but also to reservoirs found in the dry zone. Of the threats identified three need immediate attentions. If no action is taken, not only the fish resources of the lagoon, the lagoon itself may face serious problems. According to the description given by older fishermen and the observations made the size and the shape of the lagoon has changed during the past several years and show clear indications of destruction.

The three major threats identified in need of attention are,

(a) The area of the lagoon getting reduced

- (i). Land fill, land encroachment and dumping solid waste to the lagoon.
- (ii). River water entering the lagoon getting reduced.

(b) Reduction in size of the fish resource

- (i). Uncontrolled fishing.
- (ii). Use of Prohibited fishing gear

(c) Destruction to fish

- (i). Fishing ground getting covered with silt.
- (ii). Inflow of pesticides

(a). The area of the lagoon getting reduced

(i) Land fills, land encroachments, dumping solid waste to the lagoon:

The peripheral lands of north and north-west of the lagoon are highly populated. After tsunami, population had increased substantially as a result of new houses being put up by the government and non government agencies for the tsunami affected persons. Since these areas are safer and are not vulnerable to tsunami, persons affected by tsunami prefer to live in these newly created villages in the northern sector of the lagoon.

In Alayadivembu DS division, GN divisions Alayadivembu, Akkaraipattu (1-10) Sinna-Muhathuwaram, Vachchikuda, Nawatkadu, Kolavil (1-3) and Panangadu have very high population densities especially after tsunami. These villages are close to another highly populated area, the Akkaraipattu town. From both these areas waste is discharged to low lying areas of northern sector of Periya Kalapuwa lagoon and to the near by marsh.

In the past few years large number of occupants in the villages mentioned above has filled the low lying areas in order to expand their gardens, aggravating the situation. If the filled land is closely examined it can be seen that the low lying areas found close to the villages were once part of the Periya kalapu lagoon system and it is gradually disappearing due to steady land fill and encroachments.

A strip of marshy land separates the highly populated Akkaraipattu and Alayadivembu towns from rest of the Alayadivembu DS division, consisting of Sinna Panangadu and Kannaki Kiramam villages. This strip of marsh would have been a very wide area earlier and was part of the Periya kalapu lagoon.

This trend in filling and encroaching to the lagoon is continuing even in the north western sector of the lagoon. Reclaiming lands in Grama Niladhari (GN) division of Sinna Muhathuwaram in the north eastern sector is a common sight especially during the dry south west monsoonal period. The residents here are encroaching to the

lagoon proper. A casual visitor to the area can see these encroachments on the west side of Akkaraipattu – Sinna - Muhathuwaram road .If this trend continues sooner or later the northern part of the lagoon will disappear



Land fills near Kolavil



Land fill using garbage near Kolavil



Dumping of Solid waste Alayadiwembu



Land fill near Kolavil

(ii). River water entering the lagoon getting reduced:

Periya Kalapuwa has two water sources, a fresh water source and a sea water source. The first source which is fresh water comes from several small rivers including Pannela-Oya, and Ambalan-Oya rivers and the surface drain from the villages of Aligambai, Thonikal, Kannaki Kiramam and Panangadu. This water is entering the lagoon from the western side of the lagoon.

The other source of water which is from the sea enters through the two lagoon mouths Sinna Muhathuwaram and Periya Muhathuwaram from the eastern side of the lagoon.

During the rainy season due to heavy inflow of fresh water to the Periya kalapuwa, the lagoon mouths open for the release of excess water which comes to it. The sand bar that separates the lagoon from the sea, breach due to pressure exerted by excess water in the lagoon. This makes way for the sea water to enter the lagoon through the breached sand bar of the lagoon mouths. Except on a rare occasion the quantity of fresh water that enters the lagoon is not sufficient to breach the sand bar for the sea water to make an entry in to the lagoon.

Western sector of the Periya Kalapuwa lagoon faces a big rice field. Earlier this area was a forest. It is the catchment's area of the Periya Kalapuwa. In addition to the water from this area the excess water from the Ambalan Oya and Pannela Oya after irrigating the fields in Pannela-Oya, Amblan-Oya and Manthottama villages enters the main catchment's area of Periya Kalapuwa. There the major part of the water is used to irrigate rice fields of Aligambai, Kannaki Kiramam and Panangadu villages of Alayadivembu DS division before entering Periya Kalapuwa. With more and more additions and expansions to the rice growing areas in the region less fresh water will be available for Periya Kalapuwa lagoon. These new irrigation systems will reduce the inflow of water to the lagoon even during rainy north east monsoon season. As a result sooner or later there will be less water entering the lagoon leading to a smaller lake instead of present Periya Kalapuwa which will expand with the seasonal rains.

(b). Reduction in the size of the fish resource

(i). Uncontrolled fishing:

There are fifteen fishery cooperatives (FCS) in the administrative divisions of Thirukkivil and Alayadivembu. In Alayadivembu division almost all the members' of the fishery co-operatives fish in the lagoon but in Thirukkivil division fishery co-operative members fish in Periya Kalapuwa, Korai Kalapuwa and in the sea. For them there are seven co-operatives societies.

According to the latest statistics prepared by the Ministry of Fisheries and Aquatic Resources (Census of fishery boats 2006/2007) there are 1152 members in eight fishery co-operative societies in Alayadivembu.

In Thirukkovil we can presume half of the members numbering 626 are fishing in Periya Kalapuwa lagoon and the other half fishing in the sea and in other lagoons of the area. Then the total number of fishermen fishing in the lagoon is $1152 + 626 = 1778$.

The number of persons fishing in the lagoon according to previous statistics is said to be 3000 (Statistical unit planning division, DS office, Ampara district). But according to the latest census figures published by the Ministry of Fisheries and Aquatic Resources it is around 1800.

Even this number is very high for a water body such as Periya Kalapuwa which is having an area of only 2000 ha.

The 7000 ha Negambo lagoon which is very productive and having its mouth open throughout the year has the same number of fishermen fishing in the lagoon.

If the fishermen expect a reasonable income the number fishing in Periya Kalapuwa must be reduced. This needs to be done logically and with the consent and least trouble to the fishermen in the Periya Kalapuwa who live from this source. According to the latest information all fishermen are members of the fishery co-operatives. There are no other societies other than fisheries co-operative societies fishing in the lagoon. It is very easy to control if the information given are correct, since all are members of the fishery co-operatives.

At the beginning of the management process all members who wanted to fish should be given the license to fish. These numbers could be reduced gradually to full time fishermen over the next few years. The final number has to be decided by the experts on the subject depending on the availability of fish in the lagoon. This will give a reasonable catch daily for the fishermen of Periya Kalapuwa.

(ii). Use of Prohibited Gear:

Use of prohibited fishing gear was a problem to Periya kalapu for the past 85 years or more. **In 1923 Colonial secretary's office passed a rule under section 6 and 16 of the village communities ordinance (law no 24 of 1889) prohibiting the use of Sil-valai, Pol-valai and Adisal-valai in Korai kalapu and Periya kalapu.**

Even today there are various types of gears used in the lagoon. Majority use Veechu Valai or Cast net but others use gears such as Sillu-Valai, Thangus-Valai, Athangu, Thundai, Kottu and Karappu several of the gears mentioned were banned under regulations framed under Fisheries and Aquatic Resources Act.

Following are the gears banned under Inland Fisheries Management Regulations Of 1996.

- (i). any net of mesh size 85 mm. or below
- (ii). any surrounding or towing net
- (iii). any trammel net
- (iv). any net made out of monofilament netting material.

Accordingly operation of Thangus- valai (nets made out of monofilament netting material), large Athangu (towing scoop net) have to be stopped in the lagoon.



A large Athangu used in Periya kalapuwa

Monofilament Nets used in Periya kalapuwa



**A large towing scoop net fisherman, returning after fishing
Sinna-muhathuwaram**

(c).



Cast net fishermen



Nylon net fisherman near Kolavil

Destructions to Fish Resources

(i). Fishing grounds getting covered with silt:

Aerial photos taken recently show that there is silt in certain parts of the lagoon waters. This is mainly due to the flow of water containing suspended mud particles coming into the lagoon from western side of the lagoon. As mentioned earlier there is large scale rice cultivation in the catchment area. The excess mud suspended water from these agricultural activities make way to the lagoon and settles down in the lagoon bottom covering the breeding grounds of fish.

The fish catch from the lagoon is more than 80% introduced fish species such as Golden (T), Nile Tilapia (*Tilapia nilotica*) and Japan/Selvan(T)(*Tilapia mozambica*) they make cages on the ground to lay eggs, these cages may get covered with silt and disturb laying. Not only breeding grounds getting covered but the depth of the lagoon too may get reduced as a result of the entry of mud containing silt.

(ii). Inflow of Pesticides:

Inflow of pesticides to the lagoon is also a problem to the fish. The pesticides sprayed to rice field get mixed with water and are carried to the lagoon. This water along with fertilizer applied to thousands of hectares of rice fields may cause problems to the lagoon habitat. The Pesticides will kill phytoplankton and zoo planktons in the lagoon waters and also the eggs and larvae of fish. The fertilizer such as Urea which is used largely in rice cultivation dissolves in water and enter the lagoon in the same way as silt entering the lagoon and cause plankton blooms and deprive oxygen in the water causing death to fish, as in Beria lake of Colombo.

2. Main Issues to the lagoon:

The issues of Periya kalapuwa are the important topics that are being discussed to solve number of basic problems of the lagoon. The issues which are being discussed are centered on three main basic problems. The main issues identified are given below. The first is a very controversial and the views of the main stake holders should be given the priority. A decision need to be taken after a careful study of the merits and demerits of opening the lagoon mouth. The second is lack of knowledge on the subject especially among the resource users the fishermen and the persons living bordering the lagoon. The third is due to social and supervision problem.

Dilemma of Periya Kalapuwa

- (a). Closure of the two lagoon mouths making the lagoon a fresh water lake.

Lack of awareness among the fishermen

- (a). The fisher community not aware of the threats to the lagoon and not having guidance to protect it.

Lack of consistency in fisheries data

- (a). The data on number of fishermen fishing, fishing crafts & gear and fish catch landed are not consistent.

(a). Dilemma of Periya Kalapuwa:

Closure of the two lagoon mouths leads the lagoon to a fresh water lake.

The lagoon has two outlets one at Sinna Muhathuwaram and the other at Periya Muhathuwaram. The Periya Muhathuwaram is the larger of the two as the name implies. It is the southern lagoon mouth and must have been the place from where most of the sea and lagoon water have exchanged till recently. Towards the north is Sinna Muhathuwaram, which is the smaller of the two lagoon mouths. Towards west of the road at Sinna Muhathuwaram the lagoon may be fairly deep for the fishermen to fish using cast nets .At this point the level of the road take a dive but no sea water

enters the lagoon due low pressure exerted by the lagoon water to fairly wider deposit of sand bar between the road and the sea. There may be an exchange of water between sea and the lagoon at this place but may be on a rare occasion .The cast net fishermen fishing at the Sinna Muhathuwarram river mouth have seen water flowing over the sand deposit recently but no sea water making its way to the lagoon for months. The situation is worse in the case of Periya Muhathuwaram. Although it is the larger of the two mouths, there is hardly any evidence of water exchange between the sea and the lagoon for some time.

The exchange of water between the lagoon and the sea would have gradually reduced from the time the road was constructed over the lagoon mouths. With that the salinity of the lagoon would have slowly reduced. The flora and fauna in and around the lagoon too would have changed with the gradual reduction of the salinity



The two lagoon mouths of Periya Kalapuwa

The vegetation around Korai Kalapuwa which is few km away from Periya kalapuwa gives a clue to the type of vegetation around Periya Kalapuwa before the present main road was constructed. Today there is hardly any mangrove vegetation in or around the Periya Kalapuwa.



Mangroves of Korai kalapuwa



Lagoon mouth of Korai kalapuwa

(A road under construction over the lagoon mouth)

The opening of the lagoon mouth may bring back the lagoon to its past glory. To open the mouth of the lagoon the present road has to be diverted or a small bridge need to be constructed and the sand and the rubble blocking the entrance need to be cleared. Once the blocks are removed free flow of water both ways will take place.

If the lagoon mouth is cleaned and opened the parched land we see during the dry season will get covered with water throughout the year and the whole lagoon will get completely filled with water.

The lagoon will be once again the nursery for the fish and shrimps living in the sea and will provide more prawns and fish to the coastal waters.

But the entry of sea water to the lagoon may be a problem for the farmers cultivating rice in shallow lands bordering the western sector of the lagoon. The salty lagoon water will seep in to these agricultural lands causing reduction in rice crop making rice growing uneconomical.

Today the Periya Kalapuwa is a fresh water lake. Its surrounding shows no mangrove plants. The fish that live mostly are fresh water fish. No Crabs or shrimp as in Korai - kalapu. If shrimp are present it is near the lagoon mouth. The lagoon mouth is salty due to seepage of salt water from the sea. The shrimp catch which was going up after tsunami is now going down . The large amount of sea water which entered the lagoon along with fish and shrimp larva during tsunami gave a sudden increase to the catches of fishermen. But now with hardly any sea water entering the lagoon directly from the

sea, brackish water fish catches are going down. On examining the fish landed by fishermen it is not difficult to determine whether it comes from the lagoon or not.

The fish taken from Periya Kalapuwa lagoon had following species.

Golden (T) Nile Tilapia (E) (*Tilapia nilotica*); Seppali /Japan / Selvan (T), Theppili(S) (*Thilapia mozambica*); Korali (S, T)(*Etroplus suratensis*); Lula (S) Viral(T) Snake head (E) (*Ophiocephalus striatus*) ; Sunghann (T) Hunga (S) *Hetero fossilus* Kilakkan (T) Kalanda (S) *Sillago sihama* Petiya (S) Olive Carp (E) *Puntius sarana* Uddakam(T) Olaya(S) Silver bream (E) *Gerres Sp* Keluthi (T) Anguluwa (S) Catfish (E) *Mystus sp* Fresh water prawns and few marine shrimps

The numbers of exotic fish species are few but the number of fish from each of the species landed is so large, that it is exotic fish species that dominate any landings.



Korali (S) Etroplus suratensis



Anguluwa (S) Catfish; Mystus Sp



Mannawa (S&T) Giant herring



Godaya(S)Manali(T)Grey mullet.



Mannawa (S,T) Large Herring



Golden (T) Nile Tilapia(E)Tilapia nilotica

(b). Lack of awareness among the fishermen:

Body of water such as Periya Kalapuwa lagoon is a water body that should be protected by its resource users, the fishermen for their own benefit. Majority of these resource users are not aware of the threats or the issues to the lagoon. The first priority in the management of the lagoon is to create awareness among the persons fishing in the Periya Kalapuwa lagoon and their children.

The children, the successors to the present lagoon fishermen should be made aware of the consequences to the lagoon as a result of various human activities.

As mentioned earlier there are nearly 1800 fishermen who are members of the eleven fishery co-operative societies (FCS), eight of the societies are on the west side of the lagoon and the other three are on the east side of the lagoon. In Periya Kalapuwa all fishermen are members of the mentioned societies.

After tsunami the few fishermen who were not members too joined the existing societies. It is easy to organize an awareness programmes for the benefit of the fishermen, since all fishermen are members of the co-operative societies.

If one awareness programme is arranged for each of the societies bordering the lagoon, in eleven weeks all the fishermen fishing in the lagoon can be made aware of the threats and the issues of the lagoon.

The children of grades 8-11 in schools in the vicinity of the lagoon should be made aware of the threats and issues of the lagoon since they are the future successors to the present fishermen. They can be given awareness through their social science teachers.

The regional director of education of the area has to be invited to the lagoon committee so that he will get an idea of the threats and issues to the lagoon.

Before the introduction of the awareness programme to the teachers and the students, it must be, first discussed with the regional director of education of the area and the principals of the respective schools. Their permission should be obtained .to conduct the classes during the school hours and to incorporate it to the subject of social studies. Further their permission should be obtained to release the subject teachers to follow training classes.

The teachers in charge of the subject of social studies in the mentioned classes be given 2-3 day training in theory and in practice before the lessons are given to the students.

The school children can to be taken on a field visit to show land fill, discarded solid waste, and encroachments. They also can be asked to identify different types of fish from the sea, lagoon and fresh water from market places. The students may be taken to show various mangroves plants. All these may be incorporated to the lessons of the class.

The awareness programmes for the fishermen can be joined to other on going popular programmes. Since member fishermen may not get attracted, if it is held separately. The idea of managing the lagoon through fisheries committees and declaring Periya Kalapuwa as a management area too can be incorporated to the awareness programmes for fishermen.

(c) **Lack of consistency in fisheries data.**

i Inconsistency in number of fishermen fishing in Periya Kalapuwa lagoon

In 1998 number of fishermen in DS divisions of Alayadivembu and Thirukkivil engaged in fishing was **2734** (Census of marine fisheries in Sri Lanka South, West and Eastern districts 1998).

According to the data available for the year 2002/2003 the number of fishermen in Alayadivembu and Thirukkivil Divisional Secretaries (DS) divisions was more than **3500**. (District Information book Planning Division Ampara district, District Secretariat Office 2002-2003).

The census of fishing boats 2006/2007 final report gives a different figure. According to this report in the DS divisions of Alayadivembu and in Thirukkivil the number of fishermen engaged in fishing is **2404**.

Number of fishermen in DS divisions of Alayadivembu and Thirukkivil

Year	1998	2003	2007
No fishermen in DS divisions of Alayadivembu and Thirukkivil	2734	3500	2404

The above shows the inconsistencies even in the official figures

ii Catch per unit effort for a fisherman of Periya kalapuwa is unacceptable

Fish production from FI division Alayadivembu which is on north and north-west side of the lagoon was **49,375 kg** in 2003 (Assistant director's office Kalmunai). Since all landing centers of Alayadivembu are in the northern side of Periya Kalapuwa. The total freshwater fish catch has to be from Periya Kalapuwa lagoon only.

But fish catches of Thirukkivil DS division are from the Sea, Periya Kalapuwa and from other smaller lagoons of the area. In the southern part of the lagoon which comes within Thirukkivil FI division there are three places selling fish. These places sell fish

from Periya Kalapuwa and from the adjoining lagoons as well as from the sea. According to market survey every day all fish stalls in the area sell approximately 100-150 Kg of **fresh water fish**. This gives a figure of about **40,000 kg** of fresh water fish a year for all the fish stalls and individuals who sell fish in Thirukkovil DS division.

From the above we can conclude that the total fish landings (Alayadivembu and Thirukkovil sections) from Periya Kalapuwa lagoon is approximately **90,000 kg** /year. If the fish catch data are correct then the number of fishermen fishing daily may not be that large as 3000 since it gives a catch of 90,000 kg / 3000 = 30 kg per year for a fisherman. The minimum amount that needs to be taken by a full time fisherman should be more than 300 kg per person per year. This amount can be possible if the numbers of full time fishermen are less than 300.

During southwestern monsoonal period the sea is calm, majority of the fishermen in coastal areas of Thirukkovil DS division, fish in the sea. Similarly in the case of Alayadivembu DS division, during cultivation period majority of the fishermen work in the rice fields, leaving very few people to fish in Periya Kalapuwa lagoon.

Although the numbers of fishermen fishing in the lagoon are large, majority may be part time fishermen.

iii Fishing boats used in Periya kalapuwa gives a clue to the number fishing daily.

Fishing boats used in Periya kalapuwa also gives a clue to the number fishing daily in the lagoon: According to census of boats taken in 2006/2007 the number of fishing boats used in the Periya kalapuwa lagoon are 268. All these boats are non-motorized and their distributions according to the landing places are given below.

Distribution of fishing vessels according to landing places in the Periya

Kalapuwa lagoon:

Number of fishing craft in DS division Alayadivembu

FI division	Landing site	Number of Craft
Alayadivembu	Alayadivembu	4
	Kannaki Kiramam i	14
	Kannaki Kiramam ii	14

	Kolavil i	18
	Kolavil ii	23
	Sinna Muhathuwaram	48
Grand Total		135

Number of fishing craft in DS division Thirukkivil

FI division	Landing site	Number of Craft
Thirukkivil	Thirukkivil III	9
	Thambattai I	54
	Thambattai II	57
	Thambiluvil II	4
	Thambiluvil III	8
	Thambiluvil IV	9
Grand Total		133

Census of fishing boats 2006/2007, Ministry of fisheries and aquatic resources.

In the Periya kalapuwa lagoon cast net is the gear used by the majority of the fishermen to catch fish. According to a survey conducted by NARA, cast net is used by 92% of the fishermen in the lagoon. Of the balance 8% fishermen 90% use gill nets

Majority of the cast net and gill net fishermen use boat for fishing. It was also observed that only half the number boats are used daily in fishing activities. There are 268 non-motorized crafts in Periya Kalapuwa lagoon. Of this number, 50 % (134) or less use a craft daily to fish in the lagoon. Each craft is used by one or two fishermen; this gives a figure of 268 or less to be the number fishing in the lagoon daily, using a craft. The number of fishermen not using a craft for fishing may not exceed 100. This gives a total of 300-400 to be the total number fishing in the lagoon and is a total contradiction to the figure of 3000 given in the official figures.

The inconsistencies in number of fishermen, fishing craft or the fish catch leads to difficulties in taking decisions. **If decisions are taken on the available figures it can lead to serious problems.**

PART II

The strategy aimed to mitigate the identified threats and solve the issues of Periya kalapuwa

1. A lagoon advisory committee a step towards solving threats and issues

Resources of Periya kalapuwa lagoon had been under threat for a considerable period of time. These threats would have been reduced to a greater extent if prompt action was taken by the agencies responsible. This negligence had complicated the matters to such an extent the future of the Periya kalapuwa lagoon is in doubt. Not only the state agencies but the resources users are to be blamed for the present status of the lagoon. If the state agencies responsible for protecting the lagoon and the representatives of the resources users can form a committee to save the lagoon it will be a blessing for the future of the lagoon.

If a committee consisting of officials from fisheries ministry and divisional secretaries of the two divisions and representatives of fisheries co-operatives (FCS) is formed, most of the threats to the lagoon can be solved. By having officials of the fisheries co-operatives what is expected is to inform the fisher community the actions taken and to get the support for the actions taken by the committee for their own benefit. The officials of the IUCN can organize and be the facilitator for this advisory committee.

(a) Members suggested for lagoon advisory committee

Following officials may form the advisory committee,

- i. Assistant director of fisheries. (Kalmunai)
- ii Fisheries Inspectors (FI 's) of Alayadivembu and Thirukkivil.
- iii Divisional secretaries of Alayadivembu and Thirukkivil or their representatives
- iv. Representatives from eight (FCS) fishery Co-operatives of Alayadivembu.

v. Representatives from three (FCS) fishery co-operatives of Thirukkivil, fishing in Periya Kalapuwa.

For the monthly meetings officers from other ministries or organization may be invited as and when required. At the very inception officers from education ministry may be invited to get their support and to give them a clear idea of the planned school awareness programme for the teachers and school children of grade 8-11. The departments of co-operatives, Irrigation, wild life, road development, urban development, land reclamation, agriculture, lands and agrarian services may be invited to get their support when necessary. Officials of the fishery co-operatives have to be given training on fisheries and on co-operatives. Training on co-operative methods to improve and expand the vision on co-operative system since they will be the core group for the formation of future fisheries committees. They have to be taken to other parts of the country where the co-operatives and the fisheries committees are successfully functioning,

(b) Duties of the lagoon advisory Committee

The lagoon committee should be formed for the purpose

1. To improve socio-economic standards of the lagoon fishermen through,

- i Eradication of prohibited gear
- ii Controlling the number of gear and craft used in the lagoon
- iii Action against land fill, encroachment and dumping solid waste to peripheral land of the lagoon

2 Providing help to

- i License all craft and gear used in the lagoon
- ii Survey the lagoon and,
- iii Planting Marker Posts.

3. Creating awareness among the community, especially the lagoon fishermen on issues and threats to the lagoon .This should include awareness among,

- i. Officials of fishery co-operatives,
- ii members of the fishery co-operatives,
- iii Social science teachers of schools bordering the lagoon,
- iv Students in grade 8-11 studying social science in schools bordering the Periya kalapuwa lagoon

4. Advice on how to manage the resources of the lagoon through,
 - i. Declaration of Management area for the lagoon
 - ii Creation of lagoon committees
 - iii. Creation of a Lagoon Authority

(c) Guide lines for the committee,

They must meet on a day suitable for the officer members can attend. This should be at least once in four weeks. Since the meeting is mainly to deal with fishermen and their welfare, the officers from the fisheries ministry must play an active role. A secretary to the committee must be appointed to keep a record of the discussions. Before the next meeting minutes of the earlier meeting must be distributed to the members so that they will come prepared for the meeting. A day and a place must be fixed for the following meeting

At the end of each monthly meeting progress made at the earlier meeting should be reviewed. The actions and the person responsible for the execution of actions should be identified and mentioned in the minutes of the meeting.

The members of the fishery Co-operatives should be made aware of the future actions to be taken on management of the lagoon such as

- i. formation of fisheries committee and
- ii. Designate Periya Kalapuwa and the adjoining area **a fisheries management area.**

Fisheries committee that should be formed later under fisheries committee Regulations of 1996 should designate Periya kalapuwa and the adjoining area **a fishery management area.**

(2) Plan of action to mitigate the identified threats

The three main threats identified are

- (a). Lagoon getting polluted and reduced in size.
- (b) Diminishing water flow to the lagoon.
- (c) Reduction in the size of the fish resource.
 - (i) Use of prohibited fishing gear.

(ii). Uncontrolled fishing.

The major threats identified above are the most common threats found not only in Periya Kalapuwa but in large number of inland water bodies. Of the threats the land fills, encroachments, dumping of solid and liquid waste, use of prohibited fishing gear, non control of fishing activities can be controlled by existing laws and regulations of the country.

The reduction of river water coming into the lagoon, fishing grounds getting covered with silt, inflow of pesticides and dissolved fertilizers are common to most of the inland tanks such as the small and medium size irrigational reservoirs which supply/distribute water to rice fields.

(a) Land fill, land encroachment dumping of solid waste, silt getting deposited in the lagoon bed and entry of pesticides and nutrients.

The threats due to land fills, dumping of solid waste to the lagoon and encroachments can be stopped by the respective divisional secretaries who are the guardians of state lands. They can take action against those persons taking state property illegally or without permission. To take any action officers need documentary proof also to defend the persons who fills or encroaches need proof.

At present there is no clear boundary for the lagoon. Surveying the lagoon boundary and fixing the marker post along the boundary will remove the difficulties in taking action against land fill, encroachments and dumping of solid waste. This will overcome problem of not having maps giving the boundary of the lagoon. If the boundary was surveyed and the marker post fixed on the ground people will think twice before filling the state land or encroaching to it. The officers too can take action on any one who breaks the law. Surveying the lagoon boundary is costly. But will ease divisional secretary and his officers in their work.

The entry of silt to the lagoon can be reduced by using silt traps and by removing deposited silt in the tank bed. Cost of removing silt material deposited in the form of clay in the lagoon can be recovered if the clay removed is used in brick making as in several irrigation tanks in north central province

Entry of water containing pesticide and dissolved fertilizers to the lagoon can be reduced through awareness and delaying its entry to the lagoon. Most of the present day pesticides break down with time to non toxic substances.



Brick Making in Periya Kalapuwa

(b) Reduction in entry of fresh water to the lagoon

Reduction in entry of fresh water to the lagoon is the result of water flowing through the catchment's area being used in rice cultivation. If more and more water is used the flow of water to the lagoon will get reduced leading to gradual reduction in size of the lagoon. This may lead to complete disappearance of the lagoon. To overcome further reduction in the flow of water the committee can enlighten concerned authorities regarding the future of the lagoon and its dependents and through them necessary steps can be taken to prevent further use of river water flowing in to the lagoon.

(c) Reduction in size of the fish resources

(i) Use of prohibited fishing gear

The fisheries Inspectors (FI) of the area has the legal powers to take action against any person using prohibited fishing gear in Inland water bodies under regulation 3 of the **Inland fisheries management regulations of 1996**.

Regulation 3: No person shall, except under the authority of a license issued by the director or by a licensing officer specially authorized in writing by the director in that behalf use or operate any type of fishing gear other than a rod and line for the purpose of taking fish in any part of the inland waters

(ii) Uncontrolled fishing

In the same **Inland fisheries management regulations of 1996**, under **section nine** the director of fisheries can limit the number of persons fishing in a lagoon by issuing a limited number of permits to fish in a lagoon.

Regulation 9: The director may from time to time limit the number of licenses that may be issued in any area forming part of the inland waters brought under these regulations in respect of each type of fishing gear or suspend licenses for a specified period having regard to the sustainability of the resources in any area or a particular water body

(3) Plan of action aimed at solving the major issues of the lagoon

Main Issues to the lagoon:

The main issues are the important topics that are discussed to solve the problems of the lagoon. The main issues that are being discussed are centered on three main issues.

There are three main issues identified in need of solutions. The issues are:

(a) Gradual closure of the two lagoon mouths preventing entry of sea water in to the lagoon making the lagoon a fresh water lake.

(b) The fisher community not aware of the threats to the lagoon and not having proper guidance & leadership to protect it.

(c) Discrepancies found in the data on the number of fishermen fishing, crafts operating and fish catch landed.

3 (a) Gradual closure of the two lagoon mouths

The Periya Kalapuwa lagoon has two openings to the sea. Both the openings are more or less closed, although there are number of Hume pipes laid across the road for the passage of water. For free passage of water between the lagoon and sea to take place ,the road that runs over the two river mouths has to be diverted or two small bridges has to be constructed in place of the present Hume pipes over the two river mouths

The free flow of water between the lagoon and the sea will bring back the lagoon to its former position. Sudden change of the lagoon water will be a shock to the resource, its users, and the residents and also to the farming community living around. The merits and the demerits of the changes are given in the table below

MERITS AND DEMERITS IN OPENING THE LAGOON MOUTH:

	LAGOON MOUTHS NOT OPENED	LAGOON MOUTHS OPENED
i. Fresh water fish and Prawns	No change in numbers of fish or prawns caught	There will be a reduction in fresh water fish catches
ii. Brackish water fish and shrimp.	The last few brackish water fish Species left in the lagoon will disappear	There will be marked increase of brackish Water fish& shrimps
iii. Coastal marine fish production	No change in catches	Fish catches in the sea may increase due to juveniles of fish & shrimp going back to the sea.
iv. Mangrove habitation	Number of mangrove Plants will decrease further	There will be an increase in the number and growth of Mangrove plants
v. Paddy production in the fields around the lagoon	Production may further increase	Entry of salt water will decrease the production Making it uneconomical.

The issue is a decision which needs to be taken after careful study of the merits and demerits of opening the lagoon mouth.

In **1800** James Orr had noted following during his travels in the coastal area of the east while accompanying **Hon Fredric North, the governor of coastal areas of Ceylon.** (Description of Ceylon by James Cordiner, Vol I, Page 125)

. Sep 15 th: At five O'clock A. M We recommenced our journey from Komarie and at nine reached Tirikgowelle. The country through which we passed is well

wooded, rather open than otherwise and the road upon the whole good. The soil seemed middling, Tirikgowelle is situate upon the sea shore.....

We rested until three P.M. When we departed for Karickkoddeeevu on the road to which we passed two large lakes of salt water, both full the 1st is called Pedia calapu and the other Sirelalapu which is by much the larger reaching all the way to Karickkoddeeevu, and abounding with most excellent fish, some of which I ate at Tirikgowelle.

Pedia calapu is Periya kalapu and the Sirelalapu is Siri kalapu of Kolavil. Since the period mentioned was mid September it is the north eastern monsoonal rainy period the lagoons were full unlike today. After 208 years the bigger -(Sirelalapu) or Siri kalapu is no more. Sections of this lagoon would have got silted and was converted to rice fields others would have got fused to Periya kalapu lagoon leaving few waterways & marshy lands by that name. Will this not happen to (Pedia calapu) or Periya kalapuwa in near future.

3 (b) Awareness programmes for lagoon Fishermen, school teachers and children

Solving issues through awareness

Resources uses of Periya kalapuwa are the best persons to protect the Periya kalapuwa lagoon. To get their help to protect the lagoon, first they should be made aware of the destruction caused to the lagoon as a result of various direct and indirect human activities.

Direct human activities such as excessive fishing, use of prohibited gear, dumping of solid and liquid waste to the lagoon, encroachment of the lagoon, and destruction or removal of the lagoon plants can be controlled through awareness.

Issues such as opening the lagoon mouth to allow free flow of sea water to the lagoon can be decided if the lagoon community is aware of the causes of destructions. It is easy to solve the problems if the problems and the causes for the problems are known. The best way is to give this message through the members of the lagoon fishery co-op societies numbering more than 1800. In addition to the fishermen, the children of the fishermen who attend the schools in the vicinity of the lagoon too should be made

aware of the destruction caused to the lagoon and its future. The school children should also be given the message since number of them will take to fishing after leaving school.

Awareness programmes for fishermen

- i. Members of fishermen's co-operative societies
- ii. Officials of the fishermen's co-operative societies

i. Awareness programme for fishermen

The lectures on awareness given to fishermen should include issues and threats to the lagoon, resources and environment and how it affects fishermen lively-hood. The awareness also include the value of getting boats and gear registered and licensed with the ministry and providing correct data on fishermen, fish catch and other information. The lectures should focus on value of co-operation, basics on co-operative system etc. A practical lesson may include preparation of a plan of action for future of the co-operative societies.

ii. Awareness programme for Officials of the fishermen's Co-operatives

The training class for officials of the co-operative societies needs to be longer than the training class for member fishermen. The officer members may be taken on a field trip to see co-op's which are running efficiently. To get extra funding for the awareness and co-operative programmes, help from NGO's which are active in the fisheries field in the area may be explored. The respective departments may be in a position to help in getting such programmes organized. They also may provide suitable experienced lecturers for the awareness programmes

There are twelve fishermen's co-op's societies around Periya kalapuwa lagoon. These societies have nearly 75-100 member officials. These officers have to be given training in awareness and on co-operatives. They also have to be shown societies which are functioning efficiently, followed by a visit to Batticaloa a place where number of fishery co-ops and management systems are functioning. One group class per week for a group of 3-4 societies can cover all societies within a month.

(ii). Awareness programmes for children and teachers

The awareness should be given to all lagoon fishermen and their children, who will succeed them in the profession later. But to give it only to fishermen's children may not be successful. Best way is to give it to all school children in the vicinity of the lagoon. This can be done by the teachers who teach social science in schools, as a part of the lesson on environment in social science. The students can be given lessons on Sea, lagoons and other water bodies in the area and the threats and issues to the lagoon (including Periya kalapuwa).

The teachers selected have to be given a brief training on the lessons by a master teacher on the subject of lagoon awareness. Three classes of one hour duration may be sufficient for the students for this purpose.

3 c. Lack of consistency in fisheries data

(a). The data on number of fishermen fishing, fishing crafts & gear and fish catch landed are not consistent.

The number of fishermen and other related information's given in the census reports of

- (i).The census of marine fisheries of Sri Lanka 1998
- (ii) The census of fishery boats of Sri Lanka 2006/2007

For Alayadiwembu and Thriukkivil divisional secretary's areas and the annual reports prepared by Alayadiwebu and Thirukkivil DS offices for their regions differ substantially.

It is very difficult to understand the way the figures vary annually. The number of fulltime fishermen in villages around the lagoon of Periya kalapuwa is so high that it is not possible for a lagoon of the size of Periya kalapuwa to have such a large number of full time fishermen.

The inconsistencies are mainly due to lapses of the statistical collectors and to officers of the fishery co-operatives who are responsible for providing this statistical information.

The advisory committee can analyze the lapses of the statistical collectors and recommend training needs for the field officers to strengthen the capabilities. The awareness programmes will help these field officers and officers of the fishery co-operative to provide better information. Further with the formation of management committees there will be screening in registration of fishermen under director of fisheries which will eliminate most of the increases in numbers due to monetary reasons especially after tsunami.

PART III

Management of Periya kalapuwa

Management of fish resources in Periya kalapuwa

The Responsibility of protecting Periya kalapuwa rests on resource users of the lagoon mainly the fishermen. They may be resident or the migrants' fishermen to the lagoon. It is they who know the requirements for the development of the lagoon and the actions to be taken to protect it. But they need the scientific knowledge and the guidance. The lagoon advisory committee can provide the fishermen the guidance and the knowledge. They can guide the fishermen representatives to form **fisheries committees**. These committees can be transformed later to an authority for the lagoon. The authority can prepare the guide lines for the **Periya kalapuwa management area**. Once management area is declared and the authority is formed advisory committee can transfer its function to a new committee called **lagoon coordinating committee**. They can help in solving large number of problems which may arise once management project gets off the ground.

Members proposed for the lagoon coordinating committee.

The advisory committee which may hand over the functions to the “ lagoon coordinating committee” may have the following members:

1. Two fishery inspectors (FI's), one representing Thirukkovil and the other Alayadiwembu FI areas.
2. Two divisional Secretaries or their representatives.
3. One representative from irrigation department.
4. One officer from land reclamation board.
5. One representative each from Pradesiya Sabaha's of Thirukkovil and Aliyadiwembu.
6. Representatives from migrant fishermen depending on the number of migrant fishermen fishing in Periya kalapuwa lagoon.
7. Representatives from resident fishermen registered in the Periya kalapuwa lagoon (the number depend on the number of fishermen fishing and the type of fishing).

Declaration of a fishery Management area.

The first act of the lagoon advisory committee is to educate all officer members of Fisher co-operatives through discussions and awareness programmes regarding the lagoon system, the true position of the Periya kalapuwa lagoon and the necessity of a fisheries management area to protect the lagoon.

Fisheries act on fisheries management area

To protect fish and other aquatic resources in a specific area of the country the fisheries and aquatic resources act no 2 of 1996 had made provision under section 31.

Section 31 (1) (a):

Designate prescribed area of Sri Lanka waters or land adjacent there to or both such waters and land as fisheries management areas for the purpose of this act.

Section 31 (1) (b):

Designate the fisheries committee establishes under section 32 in respect of any fisheries management area as the fisheries management authority of that area.

This should help fisheries inspectors (FI's) to prepare a declaration for a fisheries management area for Periya kalapuwa lagoon. A draft for such a declaration is given in annexure-1. Once it is prepared it should be discussed and after obtaining the approval of the committee it may be forwarded to the line officers of the department of fisheries for recommendation and finally for the approval. Once the director general approves the proposals it will be published in the government gazette by the minister in charge of fisheries.

As given in the section 31 and 32, parallel to the declaration of the fisheries management area, the lagoon advisory committee can formulate a “fishery committee” to run the affairs of the declared management area. This fishery committee will later become the lagoon authority of the declared management area.

The steps in making the fishery committee & management authority for Periya kalapuwa lagoon management area

Step: 1 A committee should be formed from the fishermen fishing in the lagoon. The committee members should come from permanent residents and from migrant fishermen.

Resident's members should be from Aliyadiwembu and Thirukkivil D.S divisions. Better to be from the 11 Grama Sevaka divisions bordering the lagoon. But the total migrants and resident fishermen representatives should not exceed 12 (Please see fisheries committee regulations 1997 for further details)

Step: 2. Secretary of the fisheries committee, (with documents as given in the fisheries committee regulations) should inform the assistant director Kalmunai (Ampara) district of the fisheries department to register the fisheries committee with the department. The director general of the department on receiving recommendation from the department's district AD will register the committee.

Step: 3 The committee can request to register, the committee as the lagoon management authority for Periya kalapuwa fishery management area. The request must come from fisheries inspector (FI) of the area.

Fisheries co-operatives officials if they wish can be in the committee. The number of members in the committee should not exceed 12. The twelve members should represent all sections of the fishermen including migrants and different gear users.

The function of the committee should be

- a. Formulate a fisheries programme for Periya kalapuwa and surrounding areas and implement planned programme.
- b. Assist its members to obtain boats, fishing gear, and equipment to be used in fishing operation.
- c. Carry out social infrastructure and welfare activities with a view to improve the living standard of the fishing community of the area.
- d. Any other activities which are beneficial to the community and approved by director fisheries.

The fisheries committees established under section 32 of the fisheries act in respect of any Management area by an order published in the gazette will be designated as a **fisheries Management authority** of that area. The authority can recommend the minister the use of different types of fishing gear that could be used in that fisheries management area.

It also can recommend establishment of seasons for different types of fish species to be taken in the management area, further the time at which fishing could be allowed

Annexure: 1

Part1 section (1) General

Government Notifications

Fisheries and Aquatic Resources Act, No2 of 1996

Order made by the minister of fisheries and Aquatic ocean resources under section 31 of the fisheries and aquatic resources.

Colombo	minister of fisheries and ocean
Date	resources

Order

The Periya kalapuwa in the Thirukkivil and Aliyadiwembu Divisional secretary's Division in Ampara District, in the eastern province covering the following Grama Niladhari Division is declared as a fisheries management Area.

A Aliyadiwembu DS division

1

2

3

4

5

B Thirukkivil DS division

1

2

3

4

2. The budget lines suggested for development of programmes for Periya kalapuwa

1.(a)Cost of conducting committee meetings

The lagoon committee should be the center of the future development. It will have representatives from the fishermen and state officers who are dealing with the subject. In order to make the committee a viable unit, incentives in the form of a payment for attendance have to be given to the committee members. A payment of Rs 750/= per sitting for the officers and Rs 300/= for the member fishermen is proposed. The seventeen member committee having five members of state officers and 12 members of fishermen need a total of Rs 7350/= for one sitting.

5 member officers @ Rs 750/=	=	Rs 3750/=
12 member fishermen @ 300/=	=	Rs 3600/=
Tea for the participants	=	Rs 650/=

The total expenditure for one sitting of the committee will be Rs. 8000/=

Total.....Rs. 8000/=

The total cost per meeting will be Rs 8000/= .If one sitting is held per month the total expenditure for one year will be 96,000/=.

An unforeseen expenditure of 12 % such as payments to invitees from various ministries also has to be added to the above sum. Then the total cost will be

Rs. 8000/= x 12 months + 12% = 110,000/=

Grand total for 12 meetings.....Rs 110,000/=

1 (b) Cost for conducting awareness programme for officials of the fishery co-operatives societies in Periya Kalapuwa.

For two lecturer on awareness and co-operatives@Rs1250x2=.Rs. 2,500/=

Organizing an awareness programme for officers of co-operatives Rs. 500/=

Stationary for the participants..... Rs 1,000/=

Refreshment for the participants..... Rs 1,000/=

Total cost for the group class of 20-25 participants Rs.5, 000/=

=====

The summary of cost for four (4) such group classes in Alayadivembu and Thirukkivil

D.S divisions will be: 5000 X 4..... Rs. 20,000/=

The cost for a field trip to Batticaloa (for transport of nearly 75-100 participants and meals, refreshments and other expenses)Rs 40,000/=

The cost for the four classes and the field trip will be Rs 60,000/=

***The total cost for conducting classes for officers of,
Fisheries Co-opsRs 60,000/=***

**1 (c). Awareness programme for members of fishermen's co-operative societies-
(Awareness programme for 12 societies);**

Lecturer and co-operative officer giving lectures @ 1250 X2.....Rs.2500/=

Stationary..... Rs.2000/=

Refreshments..... .Rs 5000/=

To organize the training class..... Rs 1000/=

Un-foreseen expenditure.....Rs 1000/=

Total cost.....Rs11500/=

11500 x 12 societies..... Rs138, 000/=

The total cost for training members of 12 fishery co-operatives

..... Rs138, 000/=

1 (d). Awareness programme for School teachers;

Fifteen Social science teachers from Schools of Alayadivembu DS division schools and equal number from Thirukkivil division may be a reasonable number to be given this training,

A payment of Rs 1,250 for a lecturer and Rs 750 for his assistant will cost Rs 2,000/= per day. In addition to this Rs 500 for the arrangements of a training class, Rs 750/= for stationary and Rs 500 /= for refreshments have to be spent for conducting a class. This will make a total of Rs 3,750/= for conducting a class of three hours. .

In addition to the above teachers who participate too have to be given a stipend of at least Rs500/= per day as an incentive. For a batch of 15 teachers the total cost will be Rs 7,500/=,

To conduct a class for fifteen teachers

the cost will be.....Rs3,750 + Rs7,500 = Rs 11,250/=

There should be three classes of three hour duration, for one group of teachers

the total cost for three classes will be; Rs 11,250/= x 3 = Rs 33,750/=

A similar set of classes has to be conducted for Thirukkivil region, that too will cost Rs 33,750/=

The total cost for teacher awareness training programme for Alayadivembu and Thirukkivil regions will be Rs 67,500/=

The cost involved in conducting lagoon committee meetings and awareness programmes

- a. Cost for conducting lagoon committee meetings (12months) Rs110, 000/=
- b Cost for the awareness of officers of fishery co-operatives....Rs 60, 000/=
- c Cost for the awareness programme for fishery co-operatives Rs138, 000/=
- d. Cost for the awareness programme for school teachers..... Rs 67, 500/=

Grand total for awareness & lagoon committee meetings programmes
.....Rs 375, 500/=

1(e) Cost of surveying and Mapping Periya kalapuwa lagoon

As mentioned the population of the northern and southern sectors of the lagoon are rapidly increasing specially after tsunami. Due to tsunami people living in vulnerable areas of the eastern part of the lagoon shifted to northern part of the lagoon for safety. In Kolavil villagers encroach and fill lagoon border with waste material such as saw dust. Others encroach in to the marshy peripheral lands of the lagoon openly. The local authority of the area seems to ignore these acts, may be due to non availability of documents to prove its rights.

Best course of action is to survey the lagoon boundary or at least the vulnerable areas and fix concrete post for the public to know the official boundary.

The lagoon is nearly 20 square kilometers and has a boundary of 20-30 kilometer. If the cost of surveying is Rs. 30,000 /= per kilometer. The surveying and mapping of whole Periya-kalapuwa lagoon boundary will cost nearly Rs 900,000/=.

Surveying 1 km of lagoon boundary.....Rs. 30,000/=

Surveying 30km lagoon boundaryRs 900,000/=

1 (f) *Cost of purchasing and fixing marker concrete posts around Periya kalapuwa*

In northern sector of the lagoon encroachments and land fills are common and is being done openly. To prevent this, the lagoon boundary needs to be demarcated and marker posts fixed immediately for people to know the lagoon boundary.

Marking the boundary of the lagoon is also important as surveying the lagoon.

Marking the boundary with concrete poles /markers is costly. To cover nearly 30 km of lagoon edge with marker post at every 100 meters need at least 300 concrete posts.

Each of these concrete posts will cost around Rs 1000 and the whole exercise will cost nearly Rs 300,000/= for the purchase of concrete posts alone

Cost of one concrete postRs 1000/=

Cost of 300 posts to be fixed right round the lagoon.....Rs 300,000/=

Transport and fixing marker post along the lagoon periphery of 30 km

Fixing and transport one postRs 200/=

Transport and fixing 300 post.....Rs 60,000/=

Total cost of concrete posts inclusive of transport and fixing

.....***Rs 360,000/=***

The two divisional secretaries (DS) being the guardians of the state lands, any action on encroachment, land fill, discharge of waste to state lands has to be taken by divisional secretaries (DS) of the respective areas.

For any action to be taken against the persons who break the law the divisional secretary's need proof such as survey maps of state lands bordering the lagoon. Such maps if not available have to be prepared. Preparation of such detail maps is costly. The committee may request from the Eastern provincial council, Fisheries department, Coast conservation department (CCD) or NGO's working in the area such as UNOPS for help in getting lagoon boundary surveyed and fixing marker posts.

(3)Time lines for fisheries management strategy and plan to address the issues:

	Item	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
1	Committee meeting						
2	Awareness for i fishermen ii teachers iii School children						
3	Rehabilitation of Co-op societies						
4	Action against banned gear						
5	Action against land fill and encroachment						
6	Work on lagoon survey						
7	Marking the lagoon boundary						
8	Issue of license to i full time fishermen ii Part time& migrant						
9	Preliminary work on management area						
10	Preliminary work on lagoon committee						

References,

- 1 Census of fishing boats 2006/2007(final report) Ministry of fisheries
- 2 Census of Marine fisheries in Sri Lanka (West, South and East) Department of Fisheries and Aquatic Resources: UNDP/FAO/SRL/91/022, Marine Fisheries Management Project.
- 3 Compendium of Fisheries Legislation of Sri Lanka, Department of Fisheries and Aquatic Resources Marine Fisheries Management Project 1998
- 4 Description of Ceylon by James Cordiner Longman, Hurst, Rees, and Orme, Aberdeen 1807
- 5 Fishing Craft and Gear of Sri Lanka Department of Fisheries and Aquatic Resources Marine Fisheries Management
- 6 Project Preliminary Assessment for the Shrimp fisheries of the Negambo Lagoon (Sri Lanka) Colombo, Sri Lanka 1998
- 7 Strategy and Programme for Post Tsunami Re construction and Development of the Marine Fisheries Sector, Ministry Of Fisheries and Aquatic Resources, Colombo Sri Lanka, 2006 Sri Lanka
- 8 UNOPS Road Prioritization Exercise book community Access Programme, EU Ampara partnership Report 2, Supplement June 2007.