RAM No.50

Ramsar Advisory Mission (RAM)

Removal of Chilika Lake Ramsar Site, India, from the Montreux Record

9-13 December 2001

Participants

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Introduction

1. The Ramsar Convention gives special attention to assisting Contracting Parties in the management of wetlands included in the List of Wetlands of International Importance (Ramsar sites), so that Parties can comply with the requirement of Article 3.1 of the Convention, which established that "The Contracting Parties shall formulate their planning so as to promote the conservation of the wetlands included in the List, and as far as possible the wise use of wetlands in their territory."

2. In particular, through Article 3.2 of the Convention, Parties should pay particular attention to Ramsar sites whose ecological character has changed, is changing or is likely to change as the result of technological developments, pollution or other human interference.

3. The Montreux Record of "Ramsar sites where changes in ecological character have occurred, are occurring or are likely to occur" was established by COP4 in 1990. Recommendation 4.8 instructed the Ramsar Bureau to maintain a record of such sites, and Resolutions 5.4 and VI.1 adopted procedures for the operation of this "Montreux Record".

4. In Resolution 5.4 the Contracting Parties determined that the purpose of the Montreux Record "is to identify priority sites for positive national and international conservation attention", and thus the intent of Recommendation 4.8 and Resolution 5.4 was that the Montreux Record would serve as a primary mechanism for Contracting Parties to fulfil their commitments under Article 3.2 of the Convention, and that its purpose should be to identify sites for positive national and international conservation attention.

5. Assistance to Parties who have placed a Ramsar site on the Montreux Record is provided, inter alia, through Ramsar Advisory Missions (RAM) arranged by the Ramsar Bureau. A RAM is a technical assistance procedure, established in 1990 through COP4 Recommendation 4.7, and formerly known as the Monitoring Procedure and the Management Guidance Procedure. The primary purpose of a RAM is to bring international assistance and advice to a Party concerning ways and means of addressing changes in the ecological character of a Ramsar site, as well as advice on the success of management interventions undertaken to address such changes.

Background

6. The Government of India became a Contracting Party to the Ramsar Convention on Wetlands on 1 February 1982. At that time, six wetlands covering 192,973 ha were listed as internationally important, including Chilika Lake, which covers 116,500 ha. The Ministry of Environment and Forests is the Administrative Authority for implementation of the Convention in India.

7. In June 1993 the Ministry of Environment and Forests requested that Chilika Lake Ramsar site be placed on the Montreux Record [m1]and identified a number of factors causing significant change to the ecological character of the site. (This information is available in a separate document at the Ramsar Bureau and is summarised below.)

8. A request to remove Chilika Lake from the Montreux Record was submitted to the Ramsar Bureau by the Ministry of Environment and Forests on 30 April 2001. The request was

accompanied by formal submission of the Montreux Record Questionnaire, which outlined management actions that had been taken to improve the ecological character of the lake.(This information is available in a separate document at the Ramsar Bureau and is summarised below.)

9. In response to this formal request, a Ramsar Advisory Mission was established to visit Chilika Lake in order to review the management actions undertaken and the reported improvements to the ecological character of the site and to prepare a report as a basis for consideration of removal of the site from the Montreux Record.

10. The Ramsar Advisory Mission was undertaken from 9 to 13 December 2001. It was led by Mr N. Kurshid (Ramsar Bureau) and included Dr C. M. Finlayson (National Centre for Tropical Wetland Research (Australia) and the Oceania representative on the Convention's Scientific and Technical Review Panel) and Dr S. Kaul (Ministry of Environment and Forests, New Delhi, India). Mr A. K Pattnaik (Chilika Development Authority, Bhubaneswar, Orissa, India) and Dr C. L. Trisal (Wetlands International (New Delhi, India)) accompanied the Advisory Mission.

11. The Advisory Mission visited Bhubaneswar and Chilika Lake and met with officials from the Orissa Department of Forests and Environment and representatives of local communities around the lake. A list of officials and local communities visited is provided in Annex 1. All arrangements in Orissa were made by the Chilika Development Authority (CDA). The CDA was created by the Government of Orissa in 1992 with the objective of restoring the degraded lake ecosystem of Chilika Lake. The principal objectives of the CDA are:

    i) to protect the lake ecosystem and its genetic biodiversity;

    ii) to survey, plan and prepare a proposal for integrated resource management in and around the lake;

    iii) to undertake multi-dimensional and multi-disciplinary development activities; and

    iv) to cooperate and collaborate with other institutions for development of the lake

12. The Terms of Reference of the RAM were:

    i) to examine the reports to the Bureau of improvements to the ecological character of the site through management actions undertaken to address each of the factors identified by the Contracting Party as adversely affecting the ecological character of the site, specifically increasing siltation, shifting of the mouth of the lake and fall in salinity, weed infestation, aquaculture, and bird hunting and other impacts on migratory birds;

    ii) to review these management actions in the context of the overall management planning process being undertaken for the site; and

Chilika Lake

Trees planted by local communities in the watershed area of Chilika Lake

iii) to include in the report of the RAM, as necessary, advice on appropriate adjustments to this management planning process so as to continue to maintain the ecological character of the site.

The ecological character of Chilika Lake

13. The concept of ecological character is included in Article 3.2 of the Ramsar Convention:

> "Each Contracting Party shall arrange to be informed at the earliest possible time if the ecological character of any wetland in its territory and included in the List has changed, is changing or is likely to change as the result of technological developments, pollution or other human interference."

14. Resolution VII.10 adopted the following definition of ecological character:

> "Ecological character is the sum of the biological, physical, and chemical components of the wetland ecosystem, and their interactions, which maintain the wetland and its products, functions and attributes."

15. An important aspect of the definition of ecological character is the inclusion of the ecological components of the wetland and the values and benefits derived by people from the wetland. The latter include wetland products, functions and attributes (Resolution VI.1, Annex 2) and are consistent with ecosystem goods and services as described under the Convention on Biological Diversity and outlined in the Millennium Ecosystem Assessment (www.millenniumassessment.org). In this respect the Ramsar Advisory Mission assessed both the ecological components of Chilika Lake as well as the use being made of the wetland ecosystem by local communities.

16. Chilika Lake was listed as a Wetland of International Importance on 1 October 1981 on the basis of Ramsar Criteria 1, 2, 3, 5, and Criteria 7 and 8 were included when the RIS was updated on 15 May 2001. The updated Ramsar Information Sheet (RIS) is held on file at the Ramsar Bureau.

17. The RIS highlights the importance of the Chilika Lake Ramsar site for its biodiversity and its economic importance to the local people. The site is a biodiversity hotspot and supports a fishery resource for more than one million people. The biodiversity includes over a million migratory waterbirds, including shorebirds; more than 400 invertebrate species; and an assemblage of marine, brackish and freshwater species, as well as several rare, endangered and threatened species. Detailed species inventories are available, although gaps exist, such as for benthic organisms.

Change in ecological character of Chilika Lake

18. Change in ecological character has been defined in terms of adverse change that has occurred at the site since the RIS was last updated. An effective monitoring program is considered a prerequisite for determining whether or not a site has undergone an adverse change in its ecological character. Resolution VII.10 adopted the following definition of change in ecological character:

Sign showing date of designation as Ramsar site and date of inclusion in the Montreux Record

View of wetland education and research centre and residential facility for researchers (under construction)

> "Change in ecological character of a wetland is the impairment or imbalance in any biological, physical, or chemical components of the wetland ecosystem, or in their interactions, which maintain the wetland and its products, functions and attributes".

19. The Chilika Development Authority has coordinated monitoring and assessment projects at Chilika Lake. These have addressed the major pressures causing adverse change in the ecological character of the lake. The primary drivers for these changes are population growth and catchment degradation, along with widespread poor awareness of the ecological processes that maintain the ecosystem and the products and functions that have hitherto been available to the local people.

20. The resultant problems, which include increased siltation, weed infestation, hunting of birds, and pollution, have posed a major threat to the sustainability of fisheries, wildlife and water quality of the lake. Overall, the general biodiversity and productivity, including that of economically valuable species in the lake, is under threat. Uncontrolled expansion of prawn aquaculture into the lake is expected to exacerbate this threat.

21. Each of these major problems (considered as proximate drivers by the Millennium Ecosystem Assessment) is described in brief below, based on the extensive literature provided by the Chilika Development Authority (list in Annex 3). In describing these, it is immediately obvious that many are interconnected and cannot readily be treated as separate entities in any management responses and interventions.

22. **Siltation**. Soil erosion is prevalent in the catchment of Chilika due to over-grazing, illicit felling, cultivation along hill slopes, and clearance of vegetation for rehabilitation and agriculture. About 365,000 tonnes of sediment is now added annually to the lake through streams of various sizes. This has resulted in siltation, reducing the area of the inlet and natural connection to the sea. Restriction of the hydraulic capacity of the inlet that connects the lake to the sea has reduced flushing of the lake and has led to a decrease in salinity and the loss of some marine and brackish water species from the ecosystem.

23. **Weed infestation**. Increased siltation and decreased salinity has promoted the spread of major weed species more tolerant of fresh and brackish water. These include *Eichhornia crassipes*, *Azolla pinnata*, and *Potamogeton pectinatus*. Weed infestation increased from 20 km2 in 1973 to nearly 400 km2 in 1993. The increased coverage has occurred mainly in the northwestern end of the lagoon and has restricted the feeding and breeding grounds of many fish of economic importance, and has also restricted the free flow of sediment.

24. **Bird hunting**. For some years, many villagers from the adjoining villages had been poaching birds from the lake as their sole means of livelihood. This activity was a serious threat to the populations of some species and severely disturbed many other species which roosted or fed in the lake.

View showing the problem of siltation in the shallow areas, due to which the old mouth of the bay was choked, causing ecological problems

A big decision by the Chilika Development Agency -- opening of a new mouth to the sea, relief for local dwellers of the bay and estuarine ecosystem

25. **Pollution**. Although water pollution from industrial sources is not a major problem around the lake, fertilizer and pesticide residues from nearby agricultural fields pose a serious problem in the northern part of the lake. Similarly, sewage and the waste water from the peripheral small villages and towns, including Balugaon and Rambha, is posing a pollution problem, although at present it is not considered a significant threat. In summary, although pollution is not yet seen as a major problem for Chilika, it has the potential to increase, and management responses may become increasingly necessary.

Management actions undertaken at Chilika Lake

26. Management of Lake Chilika was invested in the Chilika Development Authority (CDA) in 1992. The primary aims of the CDA are listed in paragraph 11 above. The CDA is headed by a Chief Executive Officer, Mr A Pattnaik, and undertakes specific activities in support of its aims.

27. Cooperation and collaboration between the CDA and other institutions are major tasks and appear to have been successfully developed. In particular, there is a large degree of cooperation with governmental agencies and institutions for data collection and analysis as well as consultation with local communities in the catchment of the lake. It is also evident that the CDA has been strongly supported by the South Asia Program of Wetlands International in formulation of action plans, documentation, and dissemination of information through publication of newsletters and brochures, etc.

28. Specific activities undertaken by the CDA include:

    i) control of the silt load delivered by the rivers;
    ii) management of weeds;
    iii) sustainable development of fisheries and aquaculture;
    iv) conservation of wildlife;
    v) restoration of islands and bird habitat;
    vi) moderation of the lake level;
    vii) environmental impact assessments;
    viii) construction of roads;
    ix) socio-economic development;
    x) promotion of ecotourism; and
    xi) capacity building in local institutions and villages.

29. This work is supported by the Ministry of Environment and Forests (MoEF) of the Government of India and through a special grant from Ministry of Finance of the Government of India. The implementation of these activities is carried out in collaboration with other institutions and associations such as village cooperatives and self-help groups. The CDA has documented much of the information about these activities and presented several talks about its work at major scientific conferences, such as the Asian Wetland Symposium (Penang, Malaysia, August 2001). This documentation was made available to the Ramsar Advisory Mission (see list in Annex 3).

Piles of nets and bamboo canes used for traditional fishing in the shallow waters of the bay

A local fisherman placing his net in the shallow waters of the bay

30. The management actions undertaken by the CDA in direct response to the adverse changes in ecological character being observed in the lake are described in the Montreux Record Questionnaire, provided to the Ramsar Bureau on 30 April 2001 and summarised below.

31. The most significant management actions that have been taken are the opening of the mouth to the sea (started in January 2000 and completed on 23 September 2000) and the dredging of a lead channel between the sea and the lake. These are the major engineering activities and have been the subject of much debate.

32. Positive changes observed since the channel was dredged have included an increase in salinity and a reduction in the rate of weed expansion, and it is anticipated that the area covered with the weed will reduce gradually. Fisheries (fish, prawn and crab) yields have increased dramatically. Fishery data for the years 2000-2001 and 2001-2002 indicate that since the opening of the lead channel to the sea and the new lake mouth, fish landings have increased from a previous average of 1600 metric tons to 4800 metric tons during 2000-2001. In 2001-2002 (up to December 2002), total landings have been 8000 metric tons and this may reach 11,000 metric tons for the full year.

33. Monitoring of the hydrobiological parameters is carried out by CDA in collaboration with Wetlands International – South Asia programme with an overall objective of enhancing the flow regime and optimising salinity levels for the maintenance of the lake's rich biodiversity. The data collected from the past few years have indicated the need for integration of the Mahanadi floodplain system in the north with the lake and the development of an effective mechanism for flushing out the sediment and nutrient-rich water from the lake. Initiatives are underway in the lake catchment to apply a river basin-scale approach to addressing the underlying causes of the problems.

34. The management actions being undertaken are coordinated by the CDA in consultation with many local stakeholders and relevant agencies and experts. For example, to assess the impact of the reduction in siltation and the opening of the new outlet, the services of the country's premier institute in this field, the National Institute of Oceanography, have been commissioned. This has resulted in a powerful and complex network of interested parties who have worked together to take the actions which have led to the positive changes in ecological character which are being observed and measured in the lake.

35. The CDA is also actively involved in local socio-economic activities in support of local communities. In this respect the CDA has developed an integrated approach to managing the lake which can be regarded as an excellent example of the whole ecosystem approach to management advocated by the Convention on Biological Diversity and in line with the Ramsar Convention's Wise Use concept.

36. The CDA has addressed the issue of illegal bird hunting by working with local NGOs and CBOs (Community-based Organizations) to form a Bird Protection Committee which has assisted in developing alternate economic activities for the villagers. By arranging soft loans and encouraging the villagers to take up other activities, the Committee has been able to extract a promise to abandon poaching of birds. This effort has been recognised at an official level and provides the basis for better management of the bird populations of the lake.

Two boats dragging a net, traditional fishing in the bay

Boats landing with their catch and auction taking place on the spot

37. Although, overall, pollution is not regarded as a major management issue for the lake, the CDA is keeping the situation under review and has plans to address pollution issues as required in the future.

Conclusions and Recommendations

38. The conclusions and advisory recommendations set out below provide a summary of the discussions held by the Ramsar Advisory Mission. In reaching their conclusions and recommendations, members of the Mission were ably assisted by many individual experts who gave clear advice and readily responded to questions and requests for further information.

39. It is a conclusion of the Mission that many major management steps had been widely debated, researched and implemented, and that this extensive consultative approach has contributed significantly to the success of the management actions undertaken.

40. A stronger future emphasis on integrated management and monitoring features in the recommendations for future actions set out below.

41. **Removal of Chilika Lake from the Montreux Record**. Based on information supplied by relevant authorities, the management actions at Chilika Lake are sufficient to recommend removal of the site from the Montreux Record. However, it is the advice of the RAM that the removal of the site from the Montreux Record should be dependent on, and accompanied by, a commitment from the Government of India and the CDA to implement the further recommendations listed below, which should be continued as part of an overall management prescription for the Ramsar site.

42. **Integrated management planning**. The multiplicity of the actions undertaken and the interconnectivity among many of the problems that have plagued the lake could be usefully contained with a single management planning document. The format of the documentation should be determined by the CDA and stakeholders and reflect the differing needs for information and detail. The Ramsar guidelines on management planning (Resolution 5.7), as further developed in *the New guidelines for management planning for Ramsar site and other wetlands* to be considered by Ramsar's COP8 in November 2002, provide guidance on the approach and structure for such management planning documentation, although it is recognised that the format of the management plan will be guided by local legal and jurisdictional considerations for the lake.

43. It is emphasised that the management plan should clearly articulate widely agreed goals and objectives, with the latter being specifically related to actions and interventions to maintain or restore the ecological character of the lake. The plan should further encourage participatory planning and consultation with key stakeholders within the lake and its immediate environs, as well as further afield in the river basin and adjacent coastal zone. In this respect the Ramsar *Guidelines on integrating wetland conservation and wise use into river basin management* (Resolution. VII.18), and the guidance being considered by COP8 on wetland issues and integrated coastal zone management (ICZM) and on water allocation and management for maintaining the ecological functions of wetlands, should be utilised. The COP8 ICZM guidelines are designed to provide guidance to Ramsar Contracting Parties

on ensuring the full incorporation and understanding of the importance and role of coastal zone wetlands in the ICZM process by the ICZM community of spatial planners, as well as by other sectors and stakeholders in the coastal zone.

44. **Local communities' participatory management**. The participatory management practices outlined and demonstrated to the Ramsar Advisory Mission should be continued and extended as practicable. The Ramsar *Guidelines on local community and indigenous people's participation in the management of wetlands* (Resolution VII.8; Ramsar Wise Use Handbook 5) should assist in further developing this aspect of the management procedures for the lake.

45. **Education and public awareness**. The community education and awareness programs outlined to the Ramsar Advisory Mission should be continued and extended where practicable. The Ramsar *Guidelines on promoting the conservation and wise use of wetlands through communication, education and public awareness* (Resolution VII.9; Ramsar Wise Use Handbook 6) can provide useful guidance, as can the further materials prepared under the Convention's CEPA Programme. Completion of the wetland interpretation centre will provide a further base for capacity building and developing awareness amongst local stakeholders of the multiple values of the lake.

46. **Community development and assistance**. The community development and assistance projects should continue in conjunction with the above-mentioned capacity building exercises. In particular, activities in the catchment that can reduce the extent of sediment delivered to the lake should be assessed and where practicable promoted and extended. Alternative economic activities such as ecotourism should be investigated in conjunction with steps to improve the efficiency of existing activities, including improved access to markets and the elimination of damaging fishing techniques. The development of these activities could be prescribed in the management plan for the lake, although specific development plans, prepared in the context of the overall management plan, may be also needed for individual activities.

47. **Monitoring**. The extensive monitoring programs underway in the lake should be continued to ensure that the biological, chemical and physical features are maintained or improved in line with the objectives agreed under the management plan.

48. Although there is good evidence that the changes to the lead channel and lake outlet have led to improvements in the ecological character of the lake, it is not known conclusively whether the outlet to the sea will remain open (models predict that it will) or the fisheries yields will be maintained, and ongoing monitoring will be needed to determine if the initial signs of beneficial ecological and production responses within the lake both continue and are sustainable. Monitoring should focus on the amount of siltation in the channel and lake outlet so as to determine if this will continue to allow suitable interchange of seawater for maintenance of the biodiversity and important fisheries and a continued reduction in area of aquatic weeds. Monitoring of the occurrence and distribution of aquatic weeds should continue. Monitoring the harvesting of fish, shrimps and prawns should continue, along with assessment of the impacts of further shrimp aquaculture.

49. Careful consideration should be given also to monitoring and, as necessary, managing tourist activities, which are believed to be increasing and which may be impacting upon the migratory and resident birds and dolphins. Measures should be considered to reduce any noise pollution caused by the old engines of boats.

Fishermen selling their shrimp catch at the local market

Traditional fishing in the bay - a fisherman shows off his recently caught carp!

49. All monitoring programs should contain schedules for reporting the information and for review. The Ramsar guidelines for monitoring ecological character (Resolution VI.1) may provide useful guidance. Monitoring of the biodiversity, fisheries, water quality and weeds should be linked as an integrated monitoring programme.

50. The emerging pressure of global climate change should be assessed and appropriate management responses, including monitoring, developed. It is noted that monitoring and management of such pressures could benefit from specific research efforts and collaboration with specific experts. The efforts of the CDA to collect further information from expert individuals and organizations are to be applauded and supported.

51. **Progress review workshop**. Given the complex nature of the lake ecosystem and its importance to local people, it would be useful to hold a workshop in about three years' time (2004 or 2005) designed to review progress and to gauge the success of the management measures in place and planned. The workshop should include technical experts with international standing to assess the longer-term outcomes of the major interventions and other management actions, including the awareness and education programs and participatory management efforts that have been implemented. The monitoring regime should be reviewed at the same time.

52. **Chilika Lake as a demonstration site for the implementation of the Ramsar Convention**. The Convention should consider using Chilika Lake as an exemplary good-practice case study of the application of the various Ramsar guidelines, and the use of the Convention's tools and approaches, to address complex site and catchment management issues. With the development of a management plan, the lake could serve as an example for other Contracting Parties interested in, for example, participatory planning, awareness and education, monitoring and integrated management. In particular, this example could assist the Convention to develop further guidance in support of the whole ecosystem approach to wetland management and provide an example of adaptive management practices for wetlands. Opportunities for wide dissemination of materials through the Convention's media, describing the experience and approach of Chilika Lake management, and opportunities for exchange visits and other mechanisms for sharing of expertise, should be explored.

Acknowledgments

53. The Ramsar Advisory Mission was undertaken at the invitation of the Ministry of Environment and Forests of the Government of India. The Mission team was accompanied by and received much support from, Mr A.K Pattnaik of the Chilika Development Authority and Dr C.L Trisal of Wetlands International. Many people assisted with the mission and we thank them for providing logistical support and for willingly giving their time to discuss the management of Lake Chilika. A separate listing of individuals and groups contacted during the mission is given in Annex 1. We are particularly grateful to the many local community groups who welcomed us to their villages and spent time discussing their aspirations for the future of the lake ecosystem.

Annex 1: List of individuals and groups contacted during the Ramsar Advisory Mission

□ 1□ Durga Prasad Dash□ Secretary, Pallishree, Bhubaneswar.□ □ 2□ Kartik Chandra Pradhan

1	Durga Prasad Dash	Secretary, Pallishree, Bhubaneswar.
2	Kartik Chandra Pradhan	President, Pallishree
3	Bijoy Kumar Jena	Secretary, Samaniwata
4	P.P.Rajgopalan	Social Activities.
5	Ranjan Kumar Behera	Treasurer, Samaniwata
6	K.N.Chari	Consultant, Watershed Project, CDA
7	Bibhisana Das	Natural Leader, Mainsha Island Village.
8	Naba Kumar Das	Natural Leader, Mainsha Island Village.
9	Pabitra Mohan Das	Fisherman, Mainsha Island Village.
10	Sarat Chandra Mohanty	Teacher, Bhabanipur.
11	Hadi Bandhu Sahu	Natural Leader, Bhabanipur
12	Naba Kumar Pradhan	Natural Leader, Bhabanipur.
13.	Bansidhar Pradhan	Natural Leader, Bhabanipur.
14.	Trinath Mohanty	Natural Leader, Bhabanipur
15	Dushashana Pradhan	Natural Leader, Bhabanipur
17	Miss Gitanjali Mohapatra	Incharge of Bagamundal Nuagaon, CEAE Center.
18	Miss Babita Mishra	Incharge of Gurubai Center
19	Miss Chandrabati Pradhan	Incharge of Parala Centre
20	Nanda Kishore Bhujabal	Vice-President, Wild-Orissa.
21	A.S.Sarangi	Principal Secretary, Forest & Environment.
22	S.K.Pattnaik	Ex-Chief Wildlife warden, Orissa
23	Mr. A.P.Tripathy	Chief Wildlife warden, Orissa
24	S.K.Nanda	Executive Engineer, Executive Engineer, CDA
25	Mr S Hota	President, Dengei watershed committee
26	Miss Saudamini Hota	Team leader Women self help group Dengei water Shed
27	Watershed community	At Sorono village
28	Members of Working Women forum (SHG) at Tangi	Birds protection committee at Sorono
29	Villagers of the Sorono Bird	

	protection committee	
30	Villagers of Island Village at Mainsha	Bhabanipur and Parala Villages
31	Villagers of Bhabanipur and Parala Island villages	
32	Sk. Ali Khan	President bird protection committee Sorono
33	Fisherman community at Fish landing center	At Sorono Village
34	Mr. Surya Narayan Mohanty	Fishery expert and consultant to CDA
35	Mr Nurul Amin	Range officer CDA
36	Mr S.K.NANDA	Executive Engineer CDA
37	Dr K.S.BHATTA, scientific officer.	In charge of monitoring laboratory CDA.

Annex 2: Definition of wetland products, functions and attributes

The Annex to Resolution VI.1 (Working definitions, guidelines for describing and maintaining the ecological character of listed sites and guidelines for operation of the Montreux Record) describes wetland products, function and attributes in the following manner:

> "Functions are activities or actions which occur naturally in wetlands as a product of the interactions between the ecosystem structure and processes. Functions include flood water control; nutrient, sediment and contaminant retention; food web support; shoreline stabilization and erosion controls; storm protection; and stabilization of local climatic conditions, particularly rainfall and temperature".
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> "Products generated by wetlands include" wildlife resources; fisheries; forest resources; forage resources; agricultural resources; and water supply. These products are generated by the interaction between the biological, chemical and physical components of a wetland".
>
> "Attributes of a wetland include biological diversity and unique cultural and heritage features. These attributes may lead to certain uses or derivation of particular products, but they may also have intrinsic, unquantifiable importance".

Annex3: List ofsupporting documents made available to the Ramsar Advisory Mission

1. Montreux Record Questionnaire
2. Updated Ramsar Information Sheet (RIS) of Chilika Lake
3. Annual Report of Chilika Development Authority 1998-1999
4. Annual Report of Chilika Development Authority 1999-2000
5. A brochure called "A new lease of life" on Chilika lake.
6. Another informative brochure called "Chilika a Ramsar Site".
7. Newsletter of Wetlands International, July 2000, Vol.1
8. Newsletter of Wetlands International, May 2001, Vol.2